

The Boston Medical and Surgical Journal

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April 4, 1918

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Addresses.

DEDICATION OF THE CHEEVER AMPHITHEATRE.

On March 21 the Surgical Amphitheatre of the Boston City Hospital was dedicated to the memory of Dr. David Williams Cheever, with a simple but impressive ceremony. The Alumni were represented by Dr. George W. Gay, Senior Surgeon of the Hospital, who presided over the occasion. The Trustees were represented by Mr. Thomas A. Forsyth, who received the bronze tablet which was presented to the Hospital by Dr. David Cheever, on behalf of the family of Dr. Cheever.

The exercises took place in the Cheever Amphitheatre at 12.30 p.m. Many distinguished Alumni were present. The absence of many of the younger men was noted, and, of course, was explained by their absence in the service.

The speakers were as follows:

Dr. George W. Gay, Senior Surgeon, Boston City Hospital.

Ladies and gentlemen:

Through the generosity of Dr. Cheever's family we are given the pleasure and privilege, on

this occasion of dedicating an interesting memorial to the memory of the surgical father of the Boston City Hospital, Dr. David Williams Cheever.

It is peculiarly gratifying that the presentation is to be made by the son of our old friend and colleague, who is a graduate of this Hospital and worthy in every way of his distinguished parent. I have the pleasure of introducing Dr. David Cheever.

Dr. David Cheever.

Mr. Forsyth, Dr. Gay, members of the Boston City Hospital Alumni Association, and invited guests:

When this Hospital was founded in 1864, it gave to the man whom we are gathered here to honor, an opportunity which he considered one of the greatest of his life. Young, well trained in his profession, but lacking the occasion, he found here a fertile field for the exercise of his powers. Appointed to be full surgeon of a great hospital at the age of thirty-three! The favor was great, and it was characteristic of Dr. Cheever that the return that he made was not niggardly. From that day he freely gave the best hours of the best days and years of his life to its service. Such devotion is not

rare among physicians; it is the proud privilege of their profession.

Among the interests which composed his life, his home stood first; next came his chosen calling, and among the elements which composed that calling were, perhaps, three chief ones,—his patients and colleagues, his teaching in the Harvard Medical School, and his service in this institution. He made of his patients the intimate and devoted friends who grow so surely in the sunlight of a sympathetic and unselfish nature. He was proud to acknowledge the debt of his forebears and himself to the training and ideals of Harvard, and he repaid his Alma Mater, in part at least, by thirty-three years of teaching of her sons. But not least among his interests was this Hospital. No one contributed more, perhaps few so much, to its growth and reputation. After the first thirty years of active service came twenty years of wise direction and counsel, diminishing only as the years brought infirmity to the body and senses, but not to mind. He never ceased zealously to guard its reputation, to honor and cherish it, to defend it from the inevitable intrigues which sometimes beset the best-governed institutions.

When the final accounting of a true physician's life is made, and, on the one hand, are set the anxieties, the toil, the disappointments, the bitter failures, the agony of self-reproach at fancied or real mistakes, and, on the other side, are set the supreme satisfactions of human suffering alleviated, of useful lives prolonged, and of premature death held at bay, who can doubt on which side of the ledger the balance rests!

None can know better than the children of Dr. Cheever how overwhelmingly the spiritual rewards and inspirations of his professional life outweighed the dissatisfaction and evils attendant thereon, and to what great degree these satisfactions were drawn from his life and work at the City Hospital. Therefore we rejoiced at the determination of the Trustees to give his name, for all time, to this operating theatre; and we are proud also of the privilege of giving to you, Sir, representing the governing board of the Hospital, this splendid portrait, from the inspired hands of Bela Pratt. We who, either as colleagues, or friends, or patients, or members of his family, have known this man in life, have the fullest confidence that this enduring bronze, the last work, alas, of a master-sculptor, will serve to perpetuate the traditions of a noble

life, in the institution to which it was so unselfishly devoted.

Dr. George W. Gay.

It is a matter of sincere regret that the honored President of the Board of Trustees is not able, by reason of his health, to be present to accept this welcome gift to the Hospital. His long service in the Hospital, his deep interest in it, and his regard for Dr. Cheever make it particularly fitting that Mr. Shuman should have been here to receive this gift. But he has delegated that duty to one whose name is known everywhere in this country because of the gift in memory of one of the members of his family, of the Forsyth Dental Infirmary—one of the great institutions of this country, and one that will elicit the gratitude of the people for all time.

I have the honor of introducing Mr. Thomas A. Forsyth.

Mr. Thomas A. Forsyth, Trustee of Boston City Hospital.

My friends:

On behalf of the Trustees it gives me exceeding pleasure to accept this splendid, striking likeness of the late Dr. David Williams Cheever. It is especially fitting that it should be placed on the walls of this amphitheatre; that it be dedicated to him because of his excellent service to poor and suffering humanity in this Hospital.

Today, as you entered, you saw flying over the entrance a service flag, whose two rows of stars signify that almost two hundred of our Hospital family have gone forth to battle for democracy. To every one of them, and to those of us remaining at home, Dr. Cheever's memory will always be an inspiration. To his family this Hospital will ever owe a debt of gratitude for their generosity in presenting this beautiful memorial which will always be a great incentive for future generations of young men here graduating.

And, my friends, I am honored to be chosen today to make this address of acceptance on behalf of the Trustees. I thank you.

Dr. George W. Gay, Senior Surgeon, Boston City Hospital.

David Williams Cheever, one of America's greatest surgeons, was a leader in the med-

THIS AMPHITHEATER IS DEDICATED TO

1831

1915



SURGEON TO THE BOSTON CITY HOSPITAL
FROM ITS FOUNDATION TO HIS DEATH

ical profession for many years. Loyal to its highest standards, representing its noblest ideals, he was a model for his chosen profession. "Difficulty, struggle, progress"—this was his motto and his daily life was consistent therewith.

Dr. Cheever served this Hospital faithfully and efficiently for more than half a century. The youngest member of the Surgical Staff, he became its sole survivor. He brought renown to the institution, was influential in its development, and lived to see it occupy a foremost position among municipal institutions. He established the first surgical clinics in this Hospital and carried them on throughout his active professional life. He gave instruction to thirty-three classes of students. As a teacher, he had few equals and no superiors. As a writer he was terse, simple and convincing. A clear thinker, a sound reasoner, and an impressive speaker, he always commanded the attention of his audience. As an author, an editor, an operator, a practitioner, he was eminently accomplished.

Dr. Cheever's sterling character, his high ideals, his strict integrity, his sound judgment, his loyalty to this Hospital and to the profession, are hereby commemorated for all time by this beautiful and appropriate memorial tablet. Through the courtesy of the Trustees it is to be placed in this amphitheatre, which is to bear his name, and in which so much of his valuable work was accomplished.

With the highest appreciation of his many noble attributes, we here and now dedicate this tablet to the memory of David Williams Cheever, as a token of our love and esteem for him and his work, and as an example and an incentive to future generations of students and physicians who will receive instruction in this institution.

PUBLIC HEALTH BENEFITED BY THE WAR.

At a meeting at Wesleyan Hall, Dr. R. Kendrick Smith of the lecture bureau of the Massachusetts Committee of Public Safety, declared that the war indirectly reacted for the better on the public health.

"The saving of food and fuel saves in the conservation of the health and strength of the people," he said. "City folks actually suffer from disease and disability caused by overeating and breathing overheated air. A prolonged

war necessitates conservation of health, strength, and efficiency of the civilian population. The youths must be made into powerful men as quickly as possible. The women must be trained to keep themselves, their children, and their men folks healthy, so that industry for the growing and manufacture of food and the preparation of munitions may go forward at top-notch speed.

Idleness, apathy, laziness, and indifference must be done away with entirely. If we pause every time we waste anything and realize that the act really shortens life in Europe, most of us will refrain from thus aiding murder, in even so remote a manner."

Original Articles.

THE SERUM-CONSERVED DRESSING FOR INDUSTRIAL WOUNDS.

By FRED R. WILLIAMS, M.D., WORCESTER, MASS.

SIR ALMROTH WRIGHT's dietum early in the present war, of no antiseptics,—that iso- or hypertonic saline dressings would be sufficient to combat infection,—would have been satisfactory perhaps if he had been dealing with civilly produced instead of wounds made by the implements of war, where the worst possible death-producing organisms are ever-present. The subject matter of this paper is based upon a close personal study of war wounds as seen in the present conflict and upon observations made at the Norton Company's hospital, of wounds as seen in civil life. Wright believed that a patient's serum would take care of his wounds and infections, and repair them more rapidly than any other agent. Leary has recently shown in this JOURNAL that if the autogenous serum is not produced in sufficient quantity, that sera from other sources may be used to advantage. On all except punctured wounds and those where primary union is expected, I believe that the one best dressing is that which will conserve the patient's serum. This dressing should be non-absorbent and non-irritating. Wax is the agent at the present time most commonly used. Its application has not been extended into as large a field as its capabilities assure. It heals readily, not because of any special properties it possesses except that it is non-irritating and non-absorbing. In those wounds of considerable loss of tissue, skin denudations, burns, frostbite, this dressing is ideal. We have found that lacerated wounds heal more rapidly and with less trouble when treated as follows: When

the wound is first seen the surrounding uninjured skin is cleaned with gasoline, and painted with tincture iodine full strength. No iodine is allowed to come in contact with the wounded surface. Wax is immediately applied. These wounds are dressed daily for the first few days, especially if there is much tissue destruction, but at these re-dressings the wound proper is not touched, consequently the so-called cleansing of its surface is omitted. An electric blower is applied as a drier, which has the advantage also of preventing the skin from becoming too blanched or parboiled. The term "pus-poultice," which I have seen applied to this form of treatment, has not been experienced by us. In the practical application of treating the industrially wounded, it may be better or perhaps necessary to see their wounds at least once daily, but the point I wish to impress is, that at these sittings the painting with iodine, and cleansing the wound with gauze or some other irritant, are not conducive to rapid repair. Wounds have done better under iodine than under the older methods because there has been less interference and contamination. We are taught that in preparing the skin for an operation, that its surface must be dry and must have been kept dry for some time prior to the application of iodine. Otherwise, it is non-penetrating. This same line of reasoning should hold in a recent wound covered with blood and serum. Practically we have gotten into no trouble by its omission. Adhesive plaster, as it is commercially known, is an excellent serum retainer. It is somewhat more absorbent than wax, and altogether its application is far more limited. Burns will heal as rapidly under adhesive as under wax, but it is less easily applied and more expensive.

CONCLUSIONS.

1. From a fair trial of unselected cases, that the serum-retained dressing is a rapid healer.
2. Wound secretion is salutary and should be conserved.
3. The most common error by nurses and others is the daily attempt to clean the wound by sponging.
4. With the serum-retained dressing, re-dressings are painless, hence without trauma. This is again conducive to rapid repair.
5. In wounds treated as above outlined, excessive granulations are never seen. Sluggish wounds are also absent.

HEALTH IN WAR INDUSTRIES.

By THOMAS F. HARRINGTON, M.D., BOSTON,

Medical Deputy Commissioner of Labor, Massachusetts.

MASSACHUSETTS, in common with many other states, is face to face today with many of those problems of industrial health and of workers' welfare that have been the cause of so much anxiety in Europe since the beginning of the war. The lesson taught by the experience abroad is that the country's man-power must be zealously conserved and safeguarded in the industrial field as in the military forces. It is equally true that each country abroad has learned that the greatest strain of the burden produced by the exigencies of the war, centers directly upon the war industries, and especially on the munition industries. Notwithstanding the heavy toll paid by European countries for their failure to recognize earlier these self-evident truths, the fact is more evident each day that the industries of this country, in many branches of war work, are operating along the same lines that brought so much confusion, discontent and failure in the labor world of Europe. The object of this article is to point out some of the fundamental causes of ill health and lessened output among industrial workers on war orders in England and France during the early years of the war, and to set forth the preventive measures found effective in combating this source of national wastage.

In Massachusetts the labor laws are guarded zealously by the State Board of Labor and Industries. The legislature created, in 1917, a special War Emergency Commission to supervise war industries requesting a modification of existing laws in order to meet the emergency. This Commission is composed of the Commissioner of Labor, two manufacturers and two representatives of labor (one woman). The requests already presented to this special commission indicate that there are many situations arising that call for special provisions in order that neither the nation's needs nor the health of the workers will be sacrificed.

WARNING.

As a foreword I would call attention to the danger of nervous and physical shipwreck confronting so many of the leaders of American genius in public life, in finance and in science. Already many of these willing volunteers are

beyond that margin of safety arbitrarily set by nature herself and are well within the danger zone in which her warning signals of impending disaster have become blurred by a deadened, overworked nervous system. The brain cannot adjust itself, without considerable effort, to the mass of detail work associated with the organization and administration by government departments to meet the demands of war-time activities. When such an adjustment is attempted by persons who had long since assigned such detail work in private business to subordinates or assistants, breakdown is inevitable. Official red-tapism and divided responsibility aggravate greatly the nervous tension. A reorganization of the working programme of our country's leaders, now on the nation's firing line in public life, is one of the most pressing problems of the day.

Nor is this danger any less in the great industries themselves. Already chief executives and responsible heads of departments are showing the effects of the nervous and physical strain of the high speeding, the long working days, the uninterrupted days of labor, the loss of sleep and the neglect of adequate rest and relaxation under which these pivotal men are laboring. In many establishments, the successful operation of these departments depends upon the direction and supervision of these men and women. They cannot be replaced readily. Their sacrifice is more than that of the individual,—great as that is,—it may result in a disaster involving an output of material most essential in the nation's crisis. The protection of this selective group of workers should be kept in mind in preventive measures created for the protection of the workers in the various war industries.

THE PROBLEM.

The health problem of the war industries is far-reaching in its effect. It may vary from simple headache, due to eye-strain, or it may involve the consideration of the causes or origin of serious organic disease with fatal results. It should not be overlooked that conditions in occupational life, capable of disabling some workers, invariably mark, to some degree, all who are fellow workers to this group. It is not practicable to give, in an article of this length, anything like a complete description of the factors and their effects involved in the problem of occupational hygiene associated with the war in-

dustries. The following general headings, however, may serve to indicate the lines along which prevention should aim.

FATIGUE.

Fatigue is more responsible than any other one cause, for the sickness, accidents, diminished efficiency, broken time and lessened output of individual workers of all classes.

The Munitions Committee of England has made some very definite and illuminating deductions from its study of this problem. These findings may be summarized as follows: Fatigue is the sum of the results of activity which show themselves in a diminished capacity for doing work. It is not to be measured by the familiar tests of bodily sensations; on the contrary, such bodily sensations are misleading and false as a guide to the presence or the degree of fatigue. Fatigue must be considered as a progressively advancing clogging of the wheels in the human mechanism by dirt, which results in a diminished capacity for performing the act that caused it. It is not to be compared with a steam engine lacking fuel. In other words, it is the accumulation, within the living elements, of the products of the chemical changes involved, and the using up of the substance supplying the chemical energy. The trouble lies in the nervous system, not in the muscular system. The muscular symptoms—"aching," "tired out," "winded," etc.—are but the referred sensations of a poisoned nervous system. The practical lesson from this fact is that as ability to perform work depends upon the functioning of the brain and nervous system primarily, any reduction in the quantity or quality of work being performed is a true index of the condition of the nervous system. Scientific industrial management that does not recognize that problem as chiefly one of fatigue of human beings with a sensitive nervous system, rather than one of machinery control, is destined to failure. The real problem in scientific industrial management is the recognition of the point in a person's working capacity at which working capacity begins to fail, and so to arrange periods of rest in relation to hours and days of work that the nervous system may have an opportunity to rid itself of the accumulated poisons. If this is not done, the accumulation of the products of wear within the body results in injury not so readily repaired by the

next period of rest, and permanent fatigue soon results.

Fatigue may arise from the maintained use of intelligence and observation, either directed steadily on one skilled task, or distributed over many tasks, *e.g.*, several machines, or it may result from the continued use of special senses and sense-organs. Work done in the natural rhythm of the worker is far less injurious in its fatigue effect than that done in unnatural rhythm imposed upon workers by the pace of the machine or by that of fellow workers. Also, monotonous work that tends to become automatic, if repeated for some time, reaches over into the psychological field, and fatigue results. Conversely, interest, stimulation (piece work), or enthusiasm may decrease fatigue even on uniform monotonous work. In other words, the signs and symptoms of fatigue will depend on whether the work requires a fixed, routine, muscular effort or whether it involves mental activity of a simple or a more complicated kind.

The true signs, as well as the real test, of fatigue are diminished capacity that impairs the quantity or the quality of the output. In estimating this test, every precaution must be exercised so that the elements of interest, stimulation, etc., outlined above, do not influence the findings. Any "planned tests" may act to defeat the purpose.

The lesson to be learned from this study of the problem of fatigue among workers is that disregard of this problem in the early days of the war has led to a reduced state of efficiency, of lowered health and of diminished output that today is collecting a heavy toll from those nations, both in the ill health of the working classes and in the damaged products of such labor. This country has already gone far in the same dangerous course, nevertheless, signs are not wanting that the Government, as well as manufacturers, recognize this great danger, and a readjustment, with an establishment of fixed standards, is taking place here and there, based upon a recognition of the physiological law of work and rest that guarantees to the individual, as well as to the nation, a constant maximum labor output capable of being maintained for a long period without sacrificing the health, happiness and contentment of the country's laboring people.

Accepting as an established fact the conclusions of the English Commission, namely, that output is a true index of fatigue, the following

observations show that fatigue progresses markedly (*i.e.*, diminished output) when the working period is carried beyond certain limits.

The problem of fatigue is influenced by many factors, *i.e.*, sex, age, position while at work, ventilation, light, temperature, etc.; nevertheless, the great factor underlying this problem is that of hours of labor, especially nights and holidays.

HOURS OF LABOR.

This factor is influenced somewhat by that of sex and kind of work, nevertheless, certain results obtained are so uniform that they may be accepted as standards for similar conditions in the industrial field in this country. The standards set in England at the end of the first year of the war have been revised, in the light of two years' experience and the strain involved by three years of war conditions, and, especially because of the rapid increase in the number of women workers entering the various industrial fields.

It has been shown conclusively, that the length of the working period is not synonymous with an increase of output; on the contrary, a reduction in the weekly hours of actual work, varying from seven to twenty hours, produced an increased hourly output of from 17 to 58%, and an increase of the relative total output of 22%. Women working on moderately heavy lathe work, whose output was 100 units when working 75 hours a week, increased their output 34% when the hours were reduced to 60 per week, and 58% when the period was reduced to a 50-hour week. In the process of milling a screw thread, in which there is no opportunity for the worker to speed up, as the process is practically one machine operation, the output increased by a reduction of the hours of work from 70 to 50 hours per week. Men engaged on heavy munition work increased their hourly output from 100 on a 60-hour week to 139 on a 50-hour week basis. Boys performing a purely automatic piece of work, and one that cannot be increased except by continuous application to their machines, increased their output from 100 on a 75-hour week to 129% when working on a 58-hour week.

Since, then, there is an actual increase of output accomplished by a reduction of hours of work, the problem has its economic side (reduced running expense) for the manufacturer, as well as the health benefits accruing from the longer period of rest in which to recover from the fa-

tigue effects and for the enjoyment of adequate sleep and recreation.

In this country, women are entering rapidly the various industries set forth in the above study. Here, however, there is no such lowered national vitality as that now existing in Europe after its three years of war strain. Consequently the present time is most opportune to emphasize the fact that the employment of women for periods now fixed by law in Massachusetts and many other states, guarantees a greater output than can be expected by an extension of the hours of labor. Any letting down of these laws, except for short periods of emergency work, cannot be justified either on the basis of economy plant operation, or on the basis of health and efficiency of the workers.

SHIFTS.

The same physiological law that governs the weekly hours of employment applies to daily hours of work. A single shift of 14 or 15 hours is unprofitable, as it entails long periods of idle machinery as well as fatigue of the workers. A two-shift plan of equal length that allows an intervening period of rest for machinery and workers is far more economical in the long run, than a continuous 24-hour period of two shifts without this break. For women, the three-shift period is almost a necessity because of the many physiological problems peculiar to that sex. The difficulty of arrangement of transportation, meal hours, welfare supervision (especially on the night shift), have all been overcome satisfactorily in many establishments, here and abroad. It has been shown that women and young persons cannot work profitably for more than 5 hours continuously, even on the one-shift plan of ten hours a day (54 hours a week). A break in addition to the regular noon hour promises greater recovery from fatigue (greater output) because of the interruption of the monotony of the long work period.

It is now so generally agreed that continuous seven days' employment is neither profitable, healthful, nor economical, that very few establishments try to carry out such a plan regularly. Time gained on Sunday is largely lost by broken time and sickness on other days in the week, or, as one foreman puts it, "Sunday work gives 6 days' output for 7 days' work on 8 days' pay." In a group of men working on sizing fuse bodies in a munitions plant, the output was increased

16% above its previous level on the discontinuance of Sunday work. All authorities agree that the employment of women and young people on Sunday, without one day's rest in seven being provided, results in a breakdown sooner or later, often when the demand for greater output is most imperative.

Tests carried out in a munitions factory showed that workers engaged in heavy work, when required to rest 15 minutes in every hour, gave a greater output than when they worked continuously. This test was carried out on piece work, and the workers convinced themselves of the advantage of these rest periods. In another factory where the work was especially monotonous, a break of 15 minutes at 11 a.m. daily increased the output materially.

NIGHT WORK.

The night employment of women and minors in industries has been illegal in many states of this country for so many years that any attempt to break down such restrictions suggests either dire necessity or retrogression. Neither seems imminent at this time. There are, however, great possibilities that the time may come, if the war is continued very long, when women workers will have to undertake night work in order to meet temporary exigencies of the war. Night work by men has never been considered economical nor satisfactory. The difficulties in the matter of supervision at night, and the upsetting of social customs during the day, have their evils in the lack of opportunities to secure the benefits of sunlight as well as the opportunities for recreation, amusement and education.

Experience has shown that women and young people bear night work badly. Their night output is materially inferior in quality and quantity to that of day work.

Much controversy has ensued relative to whether a continuous night work shift is more advantageous than an alternate day and night shift. On purely physiological grounds, *infrequent* changes are to be preferred. Exceptions are, however, found where social conditions favor a change weekly from night to day work. This system has great danger to the workers themselves, as they frequently sacrifice the daytime that should be allotted to sleep and rest, and devote it to household duties, social activities, recreation, etc.

Any night employment of women and young persons calls for the strictest system of welfare supervision. The type of supervisor for this work is far more important than that for similar work in the same establishment during the day. The night problem is very frequently one of morals. Night shifts for women workers should be so arranged, with a view of the transportation facilities of the locality, that women and young people are not compelled to be *en route* at unsuitable hours of night or early mornings.

Persons engaged in night work require food that is light and easily digestible, well cooked and appetizing, because the organs of digestion at night lack energy. The furnishing of warm food during the night work is practically a necessity in order to stimulate the flagging energy, especially that associated with early morning hours, viz., from 2 to 4 a.m. It has been demonstrated that the serving of a luncheon at 4 a.m. resulted in an increase of the output of the department where these workers were employed. It has also been shown that a break of two rest periods during the night, i.e., one of an hour and one for one-half hour or of two three-quarters of an hour rests for luncheon, diminishes fatigue and broken time greatly.

A study of the best employment of women, based upon the overtime system, i.e., one shift of 13 or 14 hours, the two-shift plan, i.e., 12 hours each, and the three-shift arrangement of eight hours to a shift, showed that the 8-hour shift yields the best results. The strain of night work is diminished, greater vigor of work is maintained throughout the shift, less time is lost by illness, and accidents are reduced greatly. In all overtime work there is a marked flagging of energy during the last hours of the working period. This is very noticeable in the diminished output at the end of a 12-hour night shift.

WOMEN WORKERS.

While the foregoing applies with special emphasis to women workers, nevertheless, the possibility of a large number of them entering the industrial life from domestic and other spheres of life less strenuous than factory life, makes especial consideration of the physical condition of women workers necessary. There is no disparagement in the statement that women are physiologically different from men so far as the ability to withstand the fatigue consequent up-

on continued work such as that involved in the war industries. This difference is emphasized greatly when a woman passes suddenly from a sedentary or domestic life to one where great muscular effort is required, and where a long period of work—standing position often—and keeping pace with rapid machine movement, are involved. Much of the resulting disability can be checked, however, in its incipency, if women workers could be induced to seek medical advice early, either provided at the factory or at a private clinic. A tactful, well-trained, industrial nurse or welfare woman, working with the women in the establishment, could bring about a greater attention to the minor ailments of women workers that would result in advice and in preventive measures, now usually neglected until serious illness results. In this connection, it seems necessary to emphasize that in the employment of women at occupations involving the handling and lifting of heavy parts, facilities should be provided for the use of overhead cranes, inclined planes, benches of suitable height, as well as for the use of boxes with casters, trolleys or other receptacles that reduce lifting and the carrying of heavy material to a minimum. The sudden, violent, or physically unsuitable movements in the operation of machines, should, so far as is practicable, be avoided. Seats should be provided for temporary rest and for such work that can be performed properly in a sitting position.

MINORS.

The employment of minors in war industries is bound to increase under the stress of drawing so many men from our industries. It is especially important that at a time when war is destroying so much of the man-power of nations, every effort should be made to guard not only against immediate breakdown of its youths, but more especially against the imposition of strain that may stunt the growth and impair a proper development of the rising generation. The physiological law that boys and girls need a reserve of energy not only for the maintenance of health, but for their growth, cannot be violated for any length of time without a penalty. Even under normal conditions, there is considerable danger of juvenile employment adversely affecting physique; this danger is materially increased by the present condition of employment. In the conservation of the health

of youths, it is essential to recall that growing boys and girls require comparatively more food than adults because it is necessary to store up energy required for growth and at the same time to make good the daily loss of energy. In this connection, it is interesting to recall that tall, lean boys and girls require more food than short, fat persons of equal weight. Also, that natural foods yield the essentials required to replace the energy expended, and for the repair and growth of the body. The cheaper foods, such as bread, margarine, porridge, milk, herrings, cheese, beans, onions, cabbage, oranges and cheaper cuts of beef, provide all the requisite nourishment, and probably better health than is derived from more highly flavored and expensive foods which only artificially stimulate the appetite.

The great question today in the health problem involved in war industries, is not wholly whether the workers are standing, without evident injury, the strain of overtime, long shifts, Sunday or night work employment, but whether they can stand it for a long period; and, secondly, whether the toll to be collected later in the ill health, lack of efficiency, and in the development of permanent organic disease, can, in any measure, be compensated by the temporary increase in income and wages for any overtime employment. Physiology has very definite and positive findings on all these matters. Any other basis of meeting the issue is shifting and unstable.

SOME RELATIONS OF EXERCISE TO NUTRITION.*

BY GEORGE VAN NESS DEARBORN, M.D.,
CAMBRIDGE, MASS.

Instructor in Psychology and Education, Sargent Normal School, Cambridge; Psychologist and Physiologist to the Forsyth Dental Infirmary for Children, Boston; etc.

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 - (c) Weakness of Digestive Secretion.
 - (d) Lowering of the Food-Appetite.
 - (e) Obesity.
 - (f) Constipation.
- Exercise during Gastric Digestion.
- II. FOOD-SUGAR.
- III. DIET FOR AMPLE PHYSICAL EXERCISE ("TRAINING.")
 - (a) Adequate in Amount, but Not Excessive.
 - (b) Abundance of Water.

- (c) No Intestinal Irritants.
- (d) Sugar in Abundance.
- (e) Four Daily Meals.
- (f) Coffee and Tea and Cocoa.
- (g) Tobacco.
- (h) Alcohol and Strychnin Forbidden. Adrenin.

IV. TOO MUCH PHYSICAL EXERCISE.

LEANNESS.
LUMBERMEN VS. VARSITY "HERO."

IN discussing the relations of bodily exercise to nutrition we are on the foundation-stones of the physiology of exercise, for this phase of the physical life, of course, underlies and conditions all the rest. Our bodies are primarily physiochemic, self-repairing machines, and require continual renewal as well as a continual supply of energy-liberating materials. On many phases of nutrition the general public needs precise and authoritative information, and for practical purposes the motto of this more or less unconscious demand is economy—economy of several things of prime importance and value to the average individual. It will be one of the purposes of this paper to show that exercise is the natural regulator of the nutritive functions, and how this control is exerted in the interests of economy and efficiency. The medical practitioner may care to have things "recalled" to him.

The most important phase of the subject is that wherein we have to deal with the effects of "too little exercise."

We may sum up the whole effect of too little exercise upon nutrition in one short word, "atony"—a lack of tone, of vigor, of activity; a condition just the opposite from that of tonicity, where there is a normal condition of tone or functional tension.

We will consider the effects of too little exercise on nutrition under six heads:

The first thing to notice is that *the vigor of the muscles of digestion is lessened*, this being really a sympathetic effect with the skeletal or voluntary muscles. The muscular vigor of the digestive musculature is too small, and this condition, known as an atonic condition of the digestive apparatus, is the most serious in the muscles of the alimentary canal. There are two fundamental things going on in the alimentary canal in the process of nutrition. One is an elaborate set of chemical reactions comprised under the technical term of "hydrolysis" (simplification due to the enzymic absorption of water), and another set of more mechanical changes due to muscular movements. It is al-

* Advance material from a forthcoming work, "The Physiology of Exercise."

most impossible to think of food passing down about thirty feet of distorted and convoluted alimentary canal without muscular movements to move it along its course. A most serious condition is paralysis in the intestines. There are longitudinal and circular muscle fibers in the intestine, and we already know of their indispensable importance. Anything which, owing to the principle of sympathy, lowers the tone of the skeletal muscles will also lower the tone of the smooth muscles of the viscera. However much food a man can digest and eat, if he is lying in bed and his skeletal muscles are in consequence weak and flaccid, his digestive processes will also be weak, because his smooth muscles will also take part in the general condition of atony. Thus, the condition of the skeletal muscles is of much nutritional importance. We know that when we invigorate a voluntary muscle by voluntary exercise, we also invigorate the smooth muscle and increase its tone and vigor, especially in the viscera and in the arteries.

Recently we have learned from the researches of various people, including those by Caroline McGill, how very closely allied are the cross-striated and the smooth muscles. In fact, the change from a smooth muscle to a cross-striated muscle takes place very easily in certain animals. Conversely in a way, anything which tends to decrease the tonus of the skeletal or voluntary muscles also affects the smooth musculature, and this effect can be seen in the smooth muscle fibers of the intestines. Here is a sympathetic degenerating atony of the muscle fibers of the intestines from a lack of all-round general exercise. You see a typical illustration of this condition in the case of convalescence from an exhausting disease. The person has lain abed for weeks, perhaps months, and has been prevented from taking any exercise. The vigor of his digestive process at the end of that period is very weak, even if he is eating very little food. In some severe thoracic diseases, it is true, the person afflicted is apt to eat even twice as much as under ordinary healthy conditions, and the food, notwithstanding, may be digested. But his digestive apparatus may be very weak purely from sympathy with the decreased vigor of the voluntary muscles, for the smooth muscles have developed sympathetically with the skeletal muscles.

Here we may be pardoned, perhaps, if we repeat from the author's "Certain Further Fac-

tors in the Physiology of Euphoria" a page devoted to the motor action of the villi in nutrition:—

Passing now to the mechanism and process of intestinal absorption we see in the neuro-musculo-glandular mechanism of the villi and the valvulae conniventes a much more competent and actively adaptable apparatus than has been disclosed heretofore. In general terms the presence of muscle means the active adaptation of an organ to conditions outside itself, for example, in the absorptive organs mentioned as well as in the spleen and ovary.

Whatever may be the adaptive movements of the valvulae, the villi are the chief immediate organs of food absorption from the intestine. There are about four million of these organs in the human. They are irregular but in general finger-shaped organs varying in length from 0.5 to 3.0 millimeters. Their combined surface area, situated as they are on the valvulae conniventes, increases the absorptive area of the intestine at least an hundred fold over what it would be were the gut a smooth-walled tube instead of one partly filled at times by these organs. The villus is a complex little organ for, besides its versatile and essential wall of columnar epithelium, it consists of smooth muscle, autonomic nerves, a conspicuous central lymphatic ("lacteal"), blood vessels, leucocytes, and connective tissue. It would be pedantic to venture conjecture as to the exact *modus operandi* of such a mechanism. Fat, however, is the only alimentary principle which is mechanically conveyed from the midst of the epithelial cells (where it is apparently synthesized from the fatty acids and glycerin) to the central lymphatic. The chief function of this "lacteal," so far as known, is to receive the fat globules and to forward them into the circulation proper via the thoracic duct. Howell says (1913): "The mechanism of absorption remains unexplained." It is, however, extremely probable that *the neuro-muscular mechanism of the villus has, as part of its function at least, the compression of the villus under nervous requisition for more fat from other parts of the body.* On this basis the villus is understandable as in part a minute reservoir of adipose material, perhaps indeed chiefly for the greatly variable use of the nervous system, nerve-cells (chromatin) and nerve fibers (myelin) alike. They clearly make up by their number what each lacks in size.

* Psychological Review, xxi, 3, May, 1914, illut'd, pp. 166-188.

The first effect, then, of too little exercise upon nutrition is that of a direct effect upon the muscles, and in this particular case, the digestive musculature.

In the second place, we must consider the effect of too little exercise upon nutrition through the nervous system. *The central nervous system lacks tone* as well as do the muscles when there is too little exercise. This lack of tone in the central nervous system helps to decrease the requisite tone in the digestive organs. A second effect, then, of atony, is a lack of tone in the nerve centers which have to do with the movements and the secretions of the digestive organs. There is a reflex and sympathetic control of the digestive apparatus, from the autonomic and from the central nervous system. When the nerve cells are not up to their normal standard, there is a lack of tone and invigoration from the spinal cord, and the sympathetic system fails to send impulses. The nerve cells are not up to their usual efficiency, perhaps because of a lessening of the chromatin granules always found in the cytoplasm of nerve cells. The lack of exercise affects the nerve centers as well as the muscles, and so the movements of the alimentary canal are less accurate and less vigorous, and, meanwhile, nerve stimulation itself is less vigorous to those parts.

Again, *the secretions of the alimentary canal are less active* and vigorous, and they are deficient in quantity, owing to the lack of all-round bodily exercise. No one has ever shown, so far as the writer knows, that these products are qualitatively changed.

A third effect of too little exercise upon nutrition is *inadequate* or "poor," *appetite*. Too little exercise lowers the appetite below the normal, or else the appetite is an artificial one, which is worse. If, owing to the sluggishness of the circulation and the atony of the muscles, the appetite be allowed to drop too low, there is a decreased demand for food, and the body is not nourished properly. The appetite for food and drink, in the case of the normal man doing little work, is for little food, while the man doing a great deal of work needs, requires, and wishes much food. In the normal, pristine individual that is the normal condition, and it is only because man has *grown into the habit of not adapting his food to the amount of his muscular work*, that the condition or ratio is not always in evidence. The normal appetite is the proper indicator of the amount of food required by the

individual. On the other hand, if the appetite is kept up artificially, the person eats a useless lot of food. This leads to a "uric-acid diathesis" and to obesity, and there is a large amount of nitrogenous waste materials that must be got rid of somehow. These waste materials continually circulate in the blood and are oxidized and katabolized directly from the circulation. The nitrogen comes from the protein substances eaten, and, some think, is converted into uric acid. This acid then circulates in the blood, and causes pains in the joints, etc.—things known to the medical man of a generation ago under the term of "uric acid diathesis." In this condition there is an excess of protein ingested, due to an artificial appetite and the eating of large amounts of general food. The muscles do not use up the protein, as there is a small demand for nitrogenous food material because of a lack of exercise. It is supposed by some, that an excess of nitrogenous material passing for long through the kidneys, gives rise to some condition allied to Bright's disease. Over-stimulation of the kidneys might very reasonably give rise to interstitial nephritis, under conditions of too little flushing out.

Another effect of too little exercise upon nutrition is seen in the condition of *obesity*.

Perhaps it may be forgiven the writer if here he quotes seven paragraphs from an article¹ on overweight, which suggests the screaming wrong and the utter needlessness of this condition of overweight:

Physiological obesity can always be reduced (as long as the kidneys, heart, and the other vital organs are sound and can stand the pressure) by a greatly increased amount of systematic exercise and by a reduction in the intake of food—the latter the more important. Increase the outgo of energy from the organism and decrease the intake of energy into the organism, and it is always possible to reduce truly physiological obesity. This is one place where a contrast appears between pathological and physiological corpulence. In many cases of physiological obesity the persons have weak hearts, stomachs, or kidneys, and these weaknesses properly prevent either a rapid decrease in the food or a rapid increase in the amount of fat-destroying exercise. Then, too, some unstable nervous systems cannot stand a quick decrease in the energy value of food, so that it is

¹ Dearborn, G. V. N.: "Get Fat and—Die," *Interstate Medical Journal*, Vol. xxiv, No. 2, February, 1917.

not safe to decrease the food supply too rapidly.

Most of the false obesity cures bring about their effects, if there be any at all, by actually disturbing and deranging the process of digestion by a distinct pathological change, while they do not attempt to remove the cause of the superfluous amount of fat.

One way to remove the cause of physiological obesity is to reduce the metabolism of food. Give the person foods that are "filling," such as bran bread and fruits and top-of-the-ground vegetables, whose tissue-forming value is small, very small, as far as calories of energy are concerned. Cellulose and water! Another method of bringing about the same result is to drink a cup of sweet, weak coffee or to eat dessert or a few pieces of candy first, so that plainer foods become tame and unpleasant to the taste, and easily foregone. Some find it easier to omit all food one day, or even two, in every week, water being meanwhile freely taken.

Because the method puts one on his own feet and makes him master of himself, perhaps the most important way in which to reduce diet is to use continuous will power of restraint. Very few really fat people have sufficient will power, however, month after month, to reduce the diet in a systematic and scientific manner. Most of them, lacking the necessary strength thus to lessen their food, go to sanatoriums and there are put under strict surveillance as regards everything pertaining to their diet. For quite a percentage of far overweighted persons it is either this heroic treatment, passively endured, or nothing.

One thing is certain. For the far larger number of persons overweight who do not find it expedient to change their actual daily occupations from a low plane of energy expense (via muscular exercise) to a higher, it is quite futile to expect weight reduction by bodily work alone, whether in a fine gymnasium, on the farm, or elsewhere. The commoner experience of middle-aged women and men who seek thus to normalize themselves hygienically and cosmetically, of course, is to *gain weight* rather than lose after the first week or so. They actually improve their general condition, as well as their food appetite, so much by the daily hour or two of unwonted highly enjoyable general exercise that their metabolism is raised so that they "put on" fat. They take just enough exercise to normalize nutrition, but not nearly enough to burn

up any tissue fat. But forty-eight hours a week of labor for each of the four weeks of several months would do it! And it is thus, and only thus for the most part, that the million retain the semblance of the properly human form, for their diet, for the most part, otherwise would be excessive.

Those who have *fatness thrust upon them* are the adipose victims of circumstances. Some of these are, of necessity, engaged in over-sedentary occupations; some are helpless cripples; some are ignorant; some are indifferent—i.e., of swinish disposition; some are wise, but weak-willed; and some are strong-willed enough, but foolish or perhaps indifferent to the length of life or to the full measure of physical and moral manhood or womanhood. But with this, although a considerable class of the obese, we need not here concern ourselves, for the scientific conditions are like unto those of the persons who achieve fatness—although, humanly speaking, far harder, because less often relieved. Yet these, too, might readily be free—free of being inefficient; free of suffering unduly in a warm atmosphere year after year; of manifold personal dermal discomforts; of shortness of breath; of sundry dangers from accidents; free, finally, of the mathematic probability of death a number of years, perhaps, before their time were they of normal weight. Does this fact not mean much?

But, after all, the problem for the portly multitude of men and of the all-too-"motherly" (!) multitude of women is one of *general essential expediency plus human personality itself!* To be fat is *grossly inexpedient* if only the people knew it, but to conquer the fatness, humorous index of ignorance or sensuality for the most part, is to rise thereby to the full stature of the human, fashioned in the godlike image of superman. The victory is easily attained when conditions are not too adverse, and it is one which tends to satisfy the vanity or the pride in the dignity of the human form; it augments efficiency and tends to the prolongation of one's years. It truly is strange that still so few effectively realize these things. Who is the good twentieth-century prophet that, in tones which all may hear, will proclaim the wrong, its utter needlessness, and the manner, often easy enough, of its righting?

The treatment of obesity is an important thing to consider in the theory and the practice of physical education. Fat comes in mechan-

cially and chemically in many diseases, especially in relation to the heart; here the presence of fat is an impediment and hindrance, as well as a cause of many disturbances in the organism.

The objection to *exercise during the process of digestion in the stomach*, is that it brings on a general muscular congestion, taking an excess of blood at the expense of the stomach. It is wrong to exercise violently immediately after a meal, because the muscles would then use the blood which should be in the stomach helping to digest the food. (Gently jolting exercises, such as sauntering, help digestion.) On the other hand, exercise within two or three hours after a meal is at the proper time, for under such conditions the blood is not needed in the process of digestion. We all know the difficulty of even trying to write or to study after a large meal. It does not make so much difference in the case of a small lunch, because the stomach, we may guess, is congested in proportion as it is full of food. By recent research it has been shown that the wall of the stomach constricts closely around the food, so that the more food a person eats the larger functionally is his stomach. Hard exercise after a hearty meal should not be indulged in, while, on the other hand, mild exercises, which tend to jolt the contents of the abdomen, are a distinct aid to digestion. Horseback riding is a fine form of exercise, and is a distinct aid. Walking, and even swinging in a hammock, aids digestion by serving to jolt the contents of the abdomen. The movements of the intestines are both pendular and peristaltic, and are distinctly aided by any mechanical movements of the body. An experiment illustrating the effect of exercise upon nutrition was carried out by Londe in 1860: Two dogs were given a big meal, and immediately afterwards one dog was submitted to violent exercise, while the other was allowed to repose. Two hours later both dogs were killed. It was found that the former had the meal already all in the intestines, entirely undigested, because it had been jolted out of its stomach into the gut by the violent exercise to which it had been submitted. The other dog had the food still in its stomach. The food was well mixed with gastric juice, and digestion was assured. This research shows that the long-standing supposition in regard to the effect of exercise after a hearty meal is a correct one. But see below.

Constipation is an important evil condition with which physical exercise and its lack have

close relations. Gant's well-known treatise discusses the effects of exercise on constipation, under seven heads:

First, the heart-action and the circulation are increased by exercise, and any increase in these benefits constipation, because the processes of absorption, nutrition, and elimination are all increased by an increase in the circulation. An increase in the circulation through the intestines hastens the processes of absorption and of nutrition, and the elimination through the kidneys. Many people do not realize what an important factor constipation is in their general health, and of how they can be constipated and yet have movements of the bowels every day. There may be accumulations of waste materials in the large intestine that may stay there indefinitely. This sort of constipation may be nearly as bad, in so far as the absorption of toxins is concerned, and the atony of the muscles of the intestines, as any other kind. A case of complete constipation, with no evacuation of the feces, is fatal, but uncommon. Weeks may elapse.

A second effect of general muscular exercise upon constipation is that it brings about an increased oxidation of the fats and the carbohydrates with a correspondingly increased elimination of carbon dioxide. Exercise, by the oxidation of the carbohydrates and the fats taken into the body, through an increased elimination of carbon dioxide, stimulates, chemically, peristalsis in the intestines, thinks Gant. I am not aware that this supposition ever has been confirmed or that it can be shown to be of more than theoretic importance.

A third effect of general muscular exercise upon constipation, or a third method of the action of exercise upon constipation, is seen in an increased power of respiration. This causes a greater demand for oxygen, and this increase in respiration deepens each time the descent of the diaphragm. The diaphragm goes down oftener, further, and harder, and in this way there is a distinct massage carried out on the liver, the gall-bladder, and upon the transverse colon. This is the most important effect of exercise upon constipation. This increased action of the diaphragm, by its massaging effects upon the liver, increases the flow of bile, and increases the peristaltic movements in the intestines by its massage of the transverse colon. Gant shows that exercise also tends to increase antiperistalsis, which is peristaltic action from

below upward, common in crustaceans, etc., and easily seen, with little trouble, in *Daphnia*.

A fourth effect of general muscular exercise on constipation is that it tends to soften the refuse matter which has accumulated in the large intestine and in the gut. By the stimulation of the pancreas, of the liver, and of the intestinal wall, the glands which pour their products out into the intestines are stimulated, and anything that serves to stimulate the secretions from the glands will bring about a softening of the feces.

A fifth effect of exercise upon constipation is along the line of a curative effect, in that exercise relieves and also lessens autointoxication. This is a form of poisoning due to some uneliminated matter formed within the body, and in which there is an absorption of various toxins from the large intestine back again into the blood. This matter is what Horace Fletcher objects to so strenuously. He says that if we were to reduce the amount of proteins consumed, we could lessen the number of bacteria in the intestines, and so lessen the amount of toxins absorbed into the blood. These toxins of bacterial origin, when they invade the system through the blood, give rise to headaches and to many indefinite things due to the evil absorption of decomposing substances, called toxins, from the large intestine. Exercise, by stimulating the movements of the large intestine, relieves this state of autointoxication. This autointoxication acts especially upon the nervous system of the individual concerned. When such a condition is present, his system, upon being relieved, gives a better chance for the normal action of the intestines. We have a sort of reflex action, in that the lessening of the toxins present in the blood allows the nervous system to act normally, and also allows its action upon the intestines to be normal, and so, indirectly, stimulates the movements of the gut.

A sixth effect of general muscular exercise upon constipation is an increase in general muscular strength. This, reflexly and sympathetically, aids the muscular power of the large intestine, and especially of the rectum. I have already shown how intimate is the sympathy between different parts of the musculature of the body. Anything that stimulates the skeletal muscles also affects the vegetative smooth muscles in all parts of the body in a more or less indirect way. The process of defecation concerned in the discharge of the feces is partly a

voluntary and partly an involuntary process. It is partly a voluntary process in that it is aided by the abdominal walls. If the abdominal walls have been strengthened by exercise, they can exert a prompter and a harder effect, and so aid defecation.

The seventh effect of general all-round exercise upon constipation is an increased power in the peristaltic movements of the intestines, by a tonic stimulation of the intestinal nerves.

These seven principles are very important as applied to the condition known as constipation. Constipation is a very common condition, so these seven principles have an added value for every teacher of physical training. Many people suffering from constipation consult teachers of physical education. They think, rightly, that they may help them, as they consider their trouble not serious enough to warrant their consulting a physician. This condition is particularly prevalent among the women, in whom, especially, constipation is a matter of great practical detriment, for it can be the source of numerous ills. Massage of the abdomen is beneficial in some cases of extreme constipation, and in fact anything is beneficial that will increase the movements of the intestines.

Sugar. A few words about sugar as a food for the muscles. There is a research in this connection carried out on two schoolboys, aged respectively seventeen and nineteen. Both had the same practice every day, that is, rowing, and they practised two hours daily for two months, and then entered for the races. They were found to be overtrained, and the doctor fed them much sugar. They had as much sugar as they wished, sometimes eating as much as five ounces just before beginning their daily exercise with the oars. Immediately all signs of overtraining began to be abolished, and the result came in about three days from the time that the eating of sugar was advised. They entered the race and won, over a large number of antagonists who had not eaten any sugar. This demonstrates one use of sugar as a food for the muscles.

The ordinary sugars are glucose (grape sugar, dextrose), cane sugar, beet sugar, maple sugar, and levulose—a sugar abundant in figs, dates, and raisins. In practice, we would include sweet chocolate in this list, and we must deplore the strength of the prejudice against glucose.

Some years ago, Harley found that the daily

consumption of seventeen and one-half ounces of sugar, more than one pound, daily, increased the power of his muscular work from 61 to 76%. A person daily consuming that amount of sugar would not get fat if he exercised enough to use it up. The maximum effect of the sugar taken in the above-cited illustration was in about two hours after it had been eaten. This same research was gone over by Schumberg, and the results were confirmed by him. Those results were that after eating sugar there is an acute and a marked increase in the power of work. As we know now, all the army diets contain a considerable amount of sugar. "Chocolates," etc., are ordered by the ton for the consumption of the army, and are part of the regular ration practically, if not technically. Queen Victoria of England at one time sent a half-pound of sweet chocolate to every British soldier in South Africa. Since that time candy has been included in the diet of every army in the world, especially in the form of chocolate. This chocolate is given to the army and to the navy on the basis that it is a concentrated and first-class food for physical exercise. Its calory value is per weight-unit more than five times that of lean beef, and it is not hard to digest, save to alimentary canals weak in fat digestion.

The fact that the maximum strengthening effect of sugar taken as a food comes in about two hours has been discovered empirically by many people on their own account, as well as by Harley.

Sugar, then, is an important and an immediate source of muscular strength, because it is metabolized easily in the tissues of the body and glycogen is made from it. Practically, then, it is only necessary for the blood to receive the digested sugar and to take it to the muscles, where it is immediately turned to glycogen and serves as the chief food of the muscle fibers. These facts in regard to sugar are something not very new and yet of recent development in their application. Twenty-five years ago there was not a trainer who would feed candy to a training squad.

A few words about *training diet*. We shall see that there is really nothing very special or peculiar about a training diet. It is not scientific to adapt the diet qualitatively to the kind of work a person is going to do, but it is necessary to adapt the diet somewhat quantitatively.

The training diet (a man or woman of athletic, or very active vocational, habits is "in train-

ing") should be ample, but not excessive in amount. I am quite sure that some training diets, extravagant in amount, are far excessive especially in the matter of lean flesh meat. On the other hand, the training diet should contain enough flesh meats, because meat, more than anything else, directly restores the wasting muscles. Sugar supplies the energy of the muscles more quickly and better than any other thing a person can eat. Some fat should be taken. The reason this is so is because the chief part of lean meat which is eaten is made up of the fat muscles of the animal, and the materials to be replaced in the human body are protein and lipoidal.

It certainly behooves college deans, university presidents, academy principals, private school proprietors and administrators, camp food-commissaries, and "such," to see well to it just now that patriotism be not made an *excuse for parsimony in feeding*,—as a matter important to good health, to efficiency, and to next year's tuitions. Cold, anxiety, and underfeeding all are helping in some institutions toward a most unpatriotic depression of efficiency and towards an increase of phthisis. For example: "We do not need to starve our own people. We have plenty for ourselves, and it is the firm policy of the Food Administration to retain for our people, by its control of exports, a sufficient supply of every essential foodstuff. We want nobody in our country to eat less than is necessary for good health and full strength, for America needs the full productive power of all its people."

The training diet should include plenty of water. This does not mean that a person needs to wash down his mouthfuls of food with gulps of water. It should be drunk with meals and between meals, but a man or a child should never wash food down mechanically. An abundant supply of water flushes out the tissues of the body and keeps the digestive apparatus loose and active. It is essential to the athlete.

Another characteristic requirement in the "training" diet of any physically very active individual is that it should have nothing in it to cause indigestion or any disturbance of the alimentary canal. Where an athlete is trained "up to the scratch," it would be a decided setback if he were to have an attack of diarrhea for even one day. Such an attack might offset all the training of weeks. For instance, baked beans are not good, owing to the essential oils

contained in them. These oils are very irritating to some alimentary canals.

Another requirement in a training diet is that there should be more sugar than in the normal diet. Sugar is the best immediate source of muscular energy, but it must not be taken in such large amounts as to produce any disturbance of the digestive apparatus. It is beneficial to eat sugar, sweets and preserves, with a meal or soon after a meal, but never in such large amounts as to disturb digestion.

Another requirement in an ideal training diet is four meals daily instead of three or even two meals a day. With four meals a day, the athlete can digest more, and make better use of more, than if he were taking only three meals a day, and the athlete must be on a *high plane of metabolic efficiency*. One need not prescribe any particular foods for a training diet, except to define sugar as an essential requirement. Something solid but easily digestible, taken into the stomach late at night, often makes one sleep better, because it takes the blood out of the brain and brings it to the digestive apparatus. If J. F. Shepard's recent contention prove true (that sleep gives cerebral congestion, some other explanation must be sought. The best time to eat fruit is in the morning, and those in training need much of it).

Some of the relations of *coffee* (and of tea and cocoa) to muscular work: In this connection, take data from a research made by Rivers and Webber, and to be found in the *Journal of Physiology*, Vol. 36, p. 46, for the year 1907. They found, first, that caffeine (theobromin is similar) increased the power of muscular work; second, they found signs of a double action: (a) an increase in the number of muscular contractions for a short time; (b) an increase in the degree and the extent of muscular contraction, for as long a time as the coffee is taken. This was a laboratory research, done with the ergograph, an instrument for measuring work done in muscular action. Probably their work was done in reference to the skeletal muscles. In general, coffee does away with temporary fatigue of the skeletal or cross-striated muscles. It increases the number of possible contractions for any time, and in any especially fatiguing work it is possible to make more contractions for a short time. The work of Hollingworth at Columbia fully corroborates (and extends) the results of this English research. Coffee imme-

diately takes effect, perhaps in about three or four minutes.

Next consider the action of *tobacco* upon muscular work: Tobacco undoubtedly decreases both the desire and the capability for doing muscular work. There is no doubt of the above statement at all nowadays. Thus, coffee might be of use in a training diet, but it must never be used to such an excess as to keep the individual awake, for sleep sometimes is the most important of all things. In regard to tobacco in a training diet, I should say no tobacco at all (unless in the evening a pipe or two?), at least, none for hours before the contest or special exertion, because tobacco distinctly reduces muscular power, probably by nicotine's depression of the action of the motor end-plates of cross-striated muscle.

Practically the same thing is true in regard to the use of *alcohol* in a training diet. Alcohol lessens the power of muscular (as of intellectual) work, and, physiologically speaking, it does so through the disturbance of coördination. The kinesthetic impulses are shut off and there cannot be from the cortex a proper coördination of the muscle fibers by the spinal grey. However, there is still a college prejudice in favor of the use of alcohol. This prejudice persists, though it has been demonstrated that its use is an absolute disadvantage in every respect to the athlete. There is here the greatest graft of money-expense to many of the varsity teams in that they are habitually inclined to think it necessary to have champagne! The use of alcohol in a training diet is out of date and one may be very emphatic on that score; snobbery underlies it, in part.

Dean LeBaron Russell Briggs, chairman of the Harvard Athletic Committee, and wise as well as influential, in his recent report well stated an obvious matter (and more politely than the "snobbery" above) as follows:—

"One thing is certain, if when the world is at peace again, and intercollegiate contests are resumed, we fail to reduce the cost of coaching and training, to inculcate notions less luxurious, and to foster a better understanding of the relation between athletics and other interests in life, we shall lose one of the opportunities so dearly bought by this war."

The universities have been prostituting the good name of physical education out of snobbery and cheap notoriety seeking, for the sake of amusing some of their alumni for a few hours

each year; while the students who *need* the exercise are grinding themselves into a kyphosis or indolently watching their hired players over-train.

Next, a research on the effect of *strychnin* on muscular work. It was made by an Englishman, Varrier-Jones, and is to be found in the *American Journal of Physiology*, 1907. He found that strychnin somewhat increased the power of muscular work at first. This probably occurred through a stimulation of the reflex centers in the spinal cord. If too much strychnin be taken of course it will tend to lessen your muscular work for good! A second result obtained in this research was that the stimulating effect of strychnin gradually disappears in about three hours' time. In Varrier-Jones's opinion, the action of strychnin is to open wider the synapses of the afferent or ingoing side of the reflex arc. This effect of strychnin was long ago discovered, empirically, by horse-trainers, whose custom it long was to inject strychnia into the horses before the races came off. In ordinary doses, strychnin does not seem to do much harm, the chief danger being that a person will take too much and thereby make himself very nervous.

Strychnin is one of the standard drugs of the world, and it is very widely used as a nerve stimulant, especially as *nux vomica*. It need not be pointed out that the use of methods and means as artificial as is strychnia is wholly unethical in sport of man or beast. It is mentioned here only because it is a neuromuscular stimulant among stimulants. Adrenin would seemingly have far more appropriate use in a contest of brawn, but whether its use would be ethical or not would be for the judges to determine.

The main thing in a training diet or in a system of training for athletic amateurs, as for amateur or professional athletes, is to see to it that the individuals get plenty of sleep; that they eliminate the use of alcohol and tobacco; and that the training diet contains the essential metabolic requirements, chemically and digestively.

The second part of our discussion of the effects of exercise on nutrition comes under the head of "*too much exercise*." There is hardly any limit to all-around normal, outdoor exercise, when the exerciser really is "in training," up to it. The actual recorded maximum was made on a static bicycle in a calorimeter some years ago, and was 14,000 calories of energy a

day. This is hard work. For example, most physicians are not expending over 3500 calories of energy an ordinary day at the outside limit. The ordinary and practical limit of the lumberman would be found to be about 7000 or 8000 calories of energy a day. All the conditions requiring a large amount of metabolism (long hours of labor, and oftentimes exposure to the cold and wet and dampness) would demand about this expenditure of energy each working day. The metabolic planes of efficiency must be maintained in order to reach and to maintain the highest limit of motor efficiency. In other words, when the appetite, the supply of food, and its absorptive consumption keep pace with katabolism and excretion, there is scarcely any theoretic limit to the height of the dynamic efficiency which an individual may attain, save that of his actual structure. Plenty of sound sleep and abundant air enable a person to live on a very high plane of efficiency. Do not imagine that one gains anything in under-sleeping. Every hour of sleep is worth much to the organism—more than many trainers realize.

Athletes in training in the average college and elsewhere tend to approach the plane of efficiency maintained by the lumberman. They are much more liable, however, to have a dangerous overdevelopment of the digestive organs, and so are in more danger of "going stale," because they are living under somewhat abnormal conditions as compared with the industrial lumberman. Athletes in training in college, for example, are pretty sure not to get as much sleep. They are more liable to be tempted to drink, and to smoke excessively, so that, on the whole, they are not comparable in practice, in so far as their plane of efficiency is concerned, with the man doing hard outdoor daily work. The exact data for comparison between the two are lacking, but the capable lumberman is certainly our kingly athlete! College athletics might do worse than to use him as the model for royal manly training.

Hypoliposis comes in under this heading of over-exertion. In a recent lecture, "Get Lean and—Homely," the author considered leanness to be occasioned mostly by seven conditions: 1, innutrition—too little food; 2, over-exercise of muscle-masses; 3, general nervousness; 4, worrying too much; 5, the spare-diet habit; 6, over-secretion of the posterior part of the hypophysis (pituitary); and 7 (perhaps a phase of No. 6?), heredity. Even if over-leanness after mid-age

be a sign of longevity, the cosmetic considerations are important, especially in women; and lean persons suffer greatly in winter from cold, and are handicapped in certain diseases. A "lucky thirteen" words stand for relief from hypoliposis: general food-abundance, fats, starch, sugar, breads and cereals, storage vegetables, nuts and dried fruits, abundant water, holiday, indolence, easy outdoor life, medical advice, and a warm climate.

A few remarks about the effect of muscular work upon *digestibility*, meaning thereby the person's ability to digest. In this connection we may bring again to notice a research made by E. C. Wait, published by the U. S. Dept. of Agriculture, and to be found in Experiment Station Bulletin No. 117. The results found in this research are negative, but none the less they are important in that they confirm what many people have long believed. In the first place, he found no difference in the *thoroughness* of the process of digestion of the food: (a) when the subject was at rest, and, (b) when the subject was walking up and down a hill about four hundred feet high. Common observation corroborates this fact. The second result in this research of Wait's is that he found no constant effect of the climbing on the excretion of nitrogen, which depends upon the relative amount of the intake of food. On the other hand, nerve fatigue and muscle fatigue are apt to cause indigestion, probably from some emotional depression.

Kadegrow, in his research made on dogs, found that active exercise delayed the secretion of pepsin somewhat. He compared in this research dogs who rested after a big meal with those which then were worked.

Gerhartz's work, found in Pflüger's *Archives*, July, 1910, was along this same line. He found that food consumption was not increased by exercise, and that the protein katabolism was somewhat lessened! He found that violent exercise before eating did not make the dogs eat more. They got their energy for the work out of the carbohydrate part of their food. This research confirms many others showing that carbohydrates and fats are the important sources of muscular energy. The results of this research are contrary to what one might expect at first, for we would expect that the dog that was working hard would eat more than if he had been resting. The discrepancy undoubtedly is temporary, and psychological rather than

metabolic. It is, of course, the common experience that we are distinctly more eager for food and that we eat more of it, after either muscular or mental work. We should develop this conscious guidance.

So much in regard to a few miscellaneous nutritional topics as they are related to physical exertion and exercise. However hard to teach to the world of men and women, assuredly they are of quite basal importance, years on end, in the economic conduct of physiologic life.

THE VENEREAL PROBLEM—THE ARMY VIEWPOINT.

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THE army viewpoint is that between the battle-line of Von Hindenburg and that of venereal disease there is a very real connection. The former is a visible, tangible barrier to the Allied advance upon Berlin, the latter a vast hidden barrier within the ranks of the Allied powers. To reach the German capital requires *men*, and many of them. Men—thousands of men—have already ceased fighting, and been carried in tow, because of venereal disease. This hidden enemy in our midst has long left behind in its wake a spectacle of human devastation, impaired efficiency and wreckage of vitality. Through its ravages many thousands of men have been rendered useless and carried on the liability list through the great battles of the war, through hours when there was a dire need for fighting power.

Three and a half years' observation of the great war have shown this Government that one of its foremost wartime duties is to protect its men from venereal disease. The experiences of the European nations, coupled with those of our own troops on the Mexican border, have been object lessons of singular value. We now know that man-power alone will win the war, and that every unit of man-power that is incapacitated from venereal infection and rendered useless as a fighting force is a greater loss than that of a man killed in action. The former is struck by an enemy from behind before he has had a chance to register an offensive blow, while the latter dies on the firing line, in a grapple with the enemy.

It is the Secretary of the Navy who has stated that, "Venereal disease is deadlier than tuberculosis. It is deadlier than cancer. War itself counts less toll of human life than this infection, whose ravages are more fearful than the Marne, Somme, Verdun, or any other bloody battlefield.

"From every nation comes evidence in support of this statement: Sixty thousand under treatment for venereal disease mentioned in one Austrian report; thirty-five thousand among the German forces during the first five months of their occupation of Belgium; seventy-eight thousand reported in late figures from the British Army; French reports equally disturbing."

Conservation is the by-word of the times. Our people have been widely educated as to the necessity for the conservation of food, fuel, our natural resources and even of human effort. Effective organizations and leaders are operating in these interests. But little enough has been said of the need for the conserving of man-power and for the control of venereal diseases, which constitute the gravest enemy to its conservation. A glimpse of a single national army cantonment with all its intricacies of supply and operation gives a small cross-section view of what merely one phase of war is. The vast human and material resources necessary to the maintenance of the war machine are incomprehensible. Any loss of man-power, attendant upon unnecessary causes, is keenly felt in the operation of this machine. Again it is Mr. Daniels whose words show vividly the effect of just such a loss, when he says that, "During the last statistical year, men of the American Navy lost 141,378 days by such diseases."

A survey of the experiences of the European nations, without quoting any figures of uncertain authorship, shows that hundreds of thousands of men, on both sides, have been incapacitated from venereal infection; that one Allied army during the first year of the war had more men rendered inactive through sex diseases than through wounds, and that numbers equivalent to whole divisions of the Austrian Army have been confined to hospitals for similar reasons.

Germany, a nation dependent for its future progress and position in the world upon the amount and calibre of its population, is clearly alive to the venereal menace, as shown by Neisser's statement that, "The very worst part of the venereal diseases is not the diseased condition

immediately following infection, but the ailments frequently developing in later years, when the war is long past and the old infection already forgotten, and the transmission of the disease to the family after the return of the troops to their homes.

"Certainly we are justified in asking the question: 'Shall we not have cripples and dependents enough to provide for as a result of wounds and hardships?' Cannot the family at least be spared this misery, and the nation this enormous financial burden, brought about by the venereal diseases? And we know how often the seemingly healthy, believing themselves really cured, infect their wives and so frequently make healthy progeny impossible. And yet after this war there is nothing our country will be more in need of than a growing population."

Blaschko, too, properly evaluates the future health of his people by saying that "The venereal diseases, gonorrhea no less than syphilis, are so great and permanent a danger to our people that every blunder, every piece of negligence of which we are guilty today will be bitterly avenged. So many thousands of the flower of our nation are falling victims to the bullets of the enemy that we must guard and value the health of the rest as a dear possession."

From these passages we perceive Germany and Austria alive to their after-war need for fit man-power. From other German and Austrian sources, which I have not time to quote, we find an analysis made of the problem of prostitution, and we see the rapid passing into obloquy of the theory of the efficiency of regimentation and segregation of prostitution, and we find also that the enemy nations have learned to recognize the menace of alcohol, prostitution, and the theory that sexual indulgence is necessary to health. The prevalence of this latter theory has done much to keep universally alive a tolerated traffic in prostitution.

Yet we do not need to turn to the map of Europe to be taught this lesson. The experiences of American troops on the Mexican border during 1916 furnished an adequate and more keenly felt lesson.

It is wise to turn for information to an authoritative report, that of Dr. M. J. Exner, on "Prostitution in Its Relation to the Army on the Mexican Border."

Summarizing the situation, Dr. Exner writes, in part, that, "The experience on the Mexican border shows that, so long as the handling

of the problem of prostitution, as it affects the army, is left to the discretion of the individual commanders, there can be no hope of a satisfactory solution. Their attitude is too varied, and their knowledge of the problem too backward. There is need of as clearly defined a policy of moral sanitation, as the government has of physical sanitation, and that policy must be made effective in uniform procedure through military order from headquarters. Any policy with reference to this question, to be sound or effective in preserving the moral integrity of the soldier, must be based on the assumption that sexual indulgence is unnecessary.

"Prostitution in relation to the army is a question with which the citizens of this country, as a whole, must more fully concern themselves, for it is not likely that the army will proceed in advance of public opinion and demand."

Likewise, Dr. Exner narrates the proven menace of alcohol to the troops on the Mexican border.

The experiences of United States troops have thus shown again, in no uncertain terms, the threefold menace of alcohol, regulation of prostitution and the theory of the necessity for sex indulgence. The lessons of the European War have now been supplemented by those learned on American soil and among American troops.

On the fifth of April came the declaration of war. On the eighteenth of May came the approval by the House of Representatives of the so-called Selective Service Act, Section 12 of which embodied the prohibition of the sale of liquor to soldiers. And now, early in February, has come a further drastic and highly effective regulation making it a crime to give, serve or knowingly deliver liquor to a soldier in any place other than in a private home to bona-fide guests. As a result of this new measure, no longer is it necessary to prove a sale of liquor to a soldier by a boot-legger. The mere giving of it on his part, or on the part of any kind-hearted hotel waiter or female escort, is sufficient for arrest and federal prosecution. Every American should take pride in the thorough protection thus accorded its fighting forces by the Government.

Section 13 of the Selective Service Act empowers the President, through the Secretaries, to take such measures as are by him deemed necessary to prevent the setting up or keeping of houses of ill fame in the vicinity of any military establishment. The Secretaries of War and the Navy, since that time, have designated

five miles as an effective radius about each military and naval station in which this practice shall be prohibited.

Underlying these measures there lies the firm belief and avowed principle of the President and the Secretaries that sexual continence is compatible with health and is the best and only sure preventive of venereal infection.

Thus government regulation has struck a blow of no uncertain force at the three-cornered menace, and the country at large is now aware that in these matters the Government has been guided only by principles of idealism and humanity.

Twenty years hence America will be aware of the importance of these steps when she surveys the effects of the World War and realizes that among her own sons the amount of venereal disease is considerably less than that among the sons of Britain, France, Germany and Austria. Future generations of America's manhood and womanhood, free from the burden of widespread venereal infection, will rightfully bear everlasting gratitude to the leaders of today, who saw the need for preventive legislation, and to the Secretaries of War and the Navy for their clear-toned dicta and their organization, in a fashion not known to other nations, of all possible forces for the protection of our fighting men.

Illegitimacy, sterility and blindness, and other maladies which are the after-effects of syphilis and gonorrhea and which reach out "to the third and fourth generations" to claim their toll, will be materially decreased by this crusade for continence. The burden of our posterity is today being made lighter. Morality is coming to the fore. It is being recognized as an essential. The people of this land are willing to endure the normal ravages of war, and in that to play their full part, but they refuse to allow America's manhood and womanhood to prostrate their virtue in the stress and recklessness of the hour. War is a ghastly thing at best; it strips a nation of its men and resources, and halts its normal progress. Nevertheless, war is heroic and justifiable in proportion to the worth of the cause it is fought for. Yet how much more ghastly if it must inevitably take its toll of the nation's standards of morality, the eternal qualities that make life worth living. And it is America's mission not merely to win the war, but to win it with a manhood and womanhood which have stood the test of battle and inward struggle, and have emerged unbesmirched and

by fire refined. The body of the nation is ready for the sacrifice, but the soul—never!

From the experiences of the European nations America can profit much, and as she takes her place beside the gallant British, French, and Italian forces, she is able to guard against evils which have done much to undermine their vitality and fighting power. Today as we survey the situations on the Russian, French, and Italian fronts and contemplate the fact that thousands of troops are on the inactive list from venereal infection, we cannot but wish that those men might now be fit to fight, fit to stem the tide of the enemy onslaught. The lesson strikes home to American hearts, and the prevention of the development of any such inactive list of American troops is now the assumed responsibility of our Government.

Since the declaration of war, from one end of the country to the other, there has been in progress a general internal house-cleaning for the safeguarding of our fighting forces. Numerous "Red Light" districts have been closed, the illegal sale, and just recently the gift, of liquor to soldiers has been carefully watched and, to a large extent, reduced, and gambling has been curbed. Nowhere has a tolerant attitude toward these three types of vice been allowed, and for their repression, coöperation between local, state, and national forces has been necessary and generally secured. San Antonio, San Francisco, New Orleans, Little Rock, Newport News, Newport, Boston, Portland (Maine), and other localities have come in for their share of criticism, but have rallied in true American spirit to eliminate their shares of the nation's menace, and have, with one accord, rejoiced in the results and have learned to realize, in the words of Major Bascom Johnson, Director of Law Enforcement for the Commissions on Training Camp Activities, that "Municipal house-cleaning, like domestic house-cleaning, requires constant vigilance." With the elimination of the Barbary Coast in San Francisco, and the closing of the noted New Orleans "crib" district, the "Red Light" district becomes almost a thing of the past, and certainly a thing generally condemned.

This house-cleaning alone has been inadequate. Along with it preventive measures have been necessary. General education on venereal diseases, on the facts of prostitution, and on the urgent need for conserving the vitality of our American men and women has advanced at a

rate that is unprecedented, and due only to the nation's unity of purpose and eagerness to face facts, when the failure to face them spells impaired efficiency, and the prolongation of the war. We find men and women and young people commencing to talk about venereal diseases with unabashed countenances; we find factories beginning to educate their employees on the menace of the venereal diseases and the need for the treatment of them; we find these factories, in some cases, supplying such treatment, and we find civil communities ready to establish venereal clinics, state and local health authorities and legislative bodies ready to declare venereal disease rightfully reportable with other communicable diseases, and we find the accelerated manufacture and distribution of salvarsan for the treatment of the increasing number of cases coming to light. For example, California has appropriated \$30,000 annually for the duration of the war for a Bureau of Venereal Diseases, and by the end of the first year of the war the municipalities, counties and the state will have expended \$100,000 on this program in all its phases; Massachusetts and Connecticut, beginning February first, have placed venereal diseases upon their reportable list, and the former is manufacturing salvarsan at the rate of 3500 doses a month for distribution to approved clinics. The Massachusetts program also provides for the establishment of venereal clinics under probable state subsidy in twelve cities of the Commonwealth. The city of Newport News, Va., in close proximity to Camp Lee, after vigorous repression of prostitution and the resulting complete overtaxing of the local jail facilities, has found it necessary and expedient to demand the purchase of a city farm to accommodate and salvage the large number of apprehended prostitutes. This series of developments is indicative of nation-wide progress.

Within the Army itself increasing success is being attained in combating venereal diseases. The Surgeon-General of the Army has gathered about him a Rotary Commission of experts to advise on venereal disease treatment and control, and in each cantonment and camp genitourinary specialists and syphilologists are stationed to administer treatment and carry out control.

Bi-weekly and, in some cases, weekly inspections ("short-arm" inspections) are held to uncover new cases, occurring at unannounced

times to prevent the concealing of symptoms by the infected men.

The men are required to attend compulsory lectures by experts on these subjects; each organization commander is also required to inform himself on the subject of venereal disease and to instruct his men accordingly; approved literature is distributed to every man, in some cases each man being required to display, at kit inspection, a printed card warning him against the diseases; poster exhibits, stereomorphograph, automatic lantern-slide projection machine and motion picture films on social hygiene are being used and being prepared for use among our fighting men. Early (prophylactic) treatment is given to men who have exposed themselves to infection, a remedial and preventive procedure that is readily understood if approached in the right light, and the purpose of which I shall briefly explain.

Once a man has been so unfortunate as to have exposed himself to possible infection by consorting with a prostitute or any loose woman, he becomes not only a possible carrier of infection, but a possible loss to his fighting organization. His infection must be eliminated at the start or prevented from developing by early treatment, and he must likewise be maintained as a fighting unit. His case must be regarded as a medical problem, as a potential source of danger to his fellow soldiers, and he must furthermore be regarded as a needed unit of man-power. Once he has exposed himself to infection it befits the army to fulfil its obligation to protect its men from exposure to every focus of communicable disease. Every mother who sends her son to the ranks expects him to be safeguarded from such exposure, whether the focus be one of smallpox or syphilis. In the administering of early treatment, or prophylactic treatment, at every regimental infirmary and at stations established for the purpose in the nearby cities and travel gateways, such as we have in Boston, Lowell, and Ayer, the venereal rate is in a measure reduced because the infection is nipped in the bud. The effectiveness of this practice is further insured by a military requirement that the soldier must report for this treatment after exposure to infection, and that he shall be court-martialed if he later develops infection and has not previously reported for the early treatment. Thus a penalty is placed upon the man who, after indulging himself, and exposing himself to infection, takes it upon himself to endanger the

well-being of others by a refusal to receive this early treatment.

This practice is compatible both with principles of medicine and morality. The matter here for concern is one of safeguarding or restoring fighting efficiency and elimination of disease, and one which must be freed from entanglement with moral issues. It is the function of the constructive and moral forces to prevent the exposure from occurring, to prevent the individual from seeking unwholesome diversion by supplying the wholesome in its stead.

The Army and the Navy regard the construction and preventive side of the problem as the most important, and upon that side endeavor to provide for the soldier wholesome recreation and counter-attractions to keep him from a desire for harmful pleasures. Morality, continence, idealism and practical religion are inculcated in the troops by the appeal and example of the officers, by the Y. M. C. A., by the Knights of Columbus, and the chaplains; recreation, athletics, amusement and instructive pursuits are supplied by these and other organizations working in the camps and in the extra-cantonment zone and in the towns and cities slightly removed from the camps.

And this leads into the field of the Commissions on Training Camp Activities, appointed by the Secretaries of War and the Navy for the purpose of keeping themselves informed as to prostitution and the illegal liquor traffic in camp environments, and of suppressing this dual evil, and for the purpose of unifying, coördinating and supervising all the agencies operating for the welfare of the soldier and sailor. These Commissions have been effective in obtaining a full measure of law enforcement and approved recreational activity within and in the vicinity of military camps and naval stations.

Reducing the highly organized work of these Commissions to their simplest terms, it is their function to see that the men are properly safeguarded from moral hazards from the time they leave home as civilians to join the ranks until they are returned again to civil life. To effect this result this comprehensive, constructive, preventive, and repressive program has been evolved.

America expects great things of her soldiers, and in no war has she expected more than in the present titanic struggle. It is the nation's duty to her defenders to return them home healthy in so far as this is humanly possible.

Father, mother, wife and sweetheart are waiting to welcome the boys home and the Government is now endeavoring to safeguard the happiness of this home-coming moment.

The Surgeon-General of the Army has taken a pioneer stand in the combat against venereal diseases, and, among other preventive and repressive measures, has organized a group of his officers to work in the extra-cantonment areas for the prevention of venereal disease. These officers are members of the Sanitary Corps, assigned to the Venereal Disease Section of the Division of Infectious Diseases of the Surgeon-General's office. In the control of venereal diseases in so far as the work of these men necessitates law-enforcement measures to combat prostitution and the illegal sale or gift of liquor, these officers cooperate with the Law-Enforcement Division of the Commission on Training Camp Activities. It is their function also to enlist civilian cooperation in combating venereal diseases, through the establishment of venereal clinics and the necessary institutions for the treatment and confinement of the convicted prostitute and incorrigible patient, through the institution of adequate medical and legal machinery, through local vigilance committees, through educational measures and social service follow-up work with girls detained, or arrested, by the police, and of girls supposed to be sources of venereal infection.

Following up the reported sources of infection of a soldier or sailor and ridding the civil community of this focus of infection is a new but important ramification of the venereal disease program of the Army and Navy. Among the venereal patients at the regimental infirmaries and at the base hospitals in many of the Army cantonments, and similarly in the Navy, the system is now in vogue of questioning the patient as to the source of his infection. In many cases it is possible to obtain from the infected man the name and address of the woman from whom the infection was acquired, and in these cases the civil community has a fixed responsibility to insist upon the treatment of these sources. The destructive power of this focus of disease is more than the equivalent of a rapacious enemy in our midst, and there is no community that cannot do an additional bit toward winning the war by determining who are these dangerous disease carriers and by placing them out of reach of our present or future fighting men.

In following up the cases stated to be sources of infection the case worker generally meets either a young and ignorant girl or a professional prostitute. In the former case it is the policy to use persuasion to get the girl voluntarily to receive treatment. If she realizes that state and federal officials are interested in her case and that public opinion is rapidly demanding her treatment she may wisely accept it; but in the latter case of the hardened professional prostitute it will often be found necessary to obtain police observation of the case for commission of a court offense, which is generally not difficult to obtain.

This type of work is new, and machinery to handle it must be developed as the work progresses. Public opinion seems to incline toward the view that the infected incorrigible woman and the professional prostitute are a sufficient menace to public health to warrant their arrest and forced detention and treatment.

The following social case history sheet is in use at Camp Devens:

SOCIAL CASE SHEET.				Base Hospital, Camp Devens, Mass. Venereal Section.	
Date	Diagnosis { Laboratory Clinical	Patient's Name	Rank	Number	Unit
		Date of Exposure to Infection and of First Symptoms			
		Source of Infection: Name and Address, if possible			
		Would patient be willing to identify her or otherwise?			
		Was she paid? (in any way, monetary or otherwise)			
		Ascertains all facts in reference to woman believed to be the source of infection. The following facts should be included:			
		Age			
		Social Condition			
		Occupation			
		Single, married, divorced, widowed			
		Had either the patient or source of infection indulged in alcohol at the time of infection?			
		Did infection take place in a house of prostitution? (Give particulars)			
		What venereal prophylaxis was used and by whom was it administered?			
		How long after exposure was venereal prophylaxis used?			
		Do you know of other cases infected from the same source?			
		Did the proprietor or keeper of the house know the room was to be used for immoral purposes?			

I have not discussed how this whole program is to be executed among our armies overseas. There the problem will be an increasing one, one where policing and repression will probably dominate over prevention and education. Suffice it to say, that every effort will be put forth to carry overseas the Government's present comprehensive program.

Some are prone to believe that the venereal rate in our army is immeasurably higher than it is. The rate in all branches of our Army is not high, and its continued decrease is indicative of the progress being made by real preventive and repressive measures. For example, during the initial three-month period of the life of our National Army, the combined venereal rate per thousand men of the Regular, National Guard and National Armies was 121.9. The individual rate per thousand men of the Regular Army during that period was 88. The rate per thousand in the National Army was 162.4. Thus it can be seen that there were approximately double the number of venereal cases among the drafted men that there were among the regulars. This is a startling fact. Likewise, after four months of the life of the National Army the rates in these two armies were nearly the same, and after the drafted men had continued under military discipline the admission rate for venereal disease became normal, and lower than that among the regulars.

The lesson of this is clear. The National Army is a body of civilians recently transformed to the military, and the venereal rate among them, picked men, is by no means in excess of the prevailing rate among the present civil population. And the reason for this is clear, yet only now being realized. The soldier is carefully educated as to the nature and ravages of venereal diseases, measures are taken to prevent his seeking irrational diversion which might cause infection, and furthermore he is treated immediately upon his falling a victim to any of this group of diseases, while the civilian, as a general rule, has not only been ignorant as to the nature of the diseases, but also as to the method of cure. The amount of unnecessary disease, suffering and unhappiness attendant upon this state of ignorance is appalling, and consequently one of the immediate needs of the time is for a widespread enlightenment of the public upon the facts. At last this is coming. Progress in this respect since the fifth day of April, when America entered the lists, indicates

that the public is not only willing to face the facts, but also demanding them. The origin and center of this education should be in the home, where father and mother by a gradual process should impart to son and daughter facts they should know. This essential, I believe, has been largely disregarded by most present-day parents. Furthermore, there is no organization, institution or public organ that cannot and should not take a common stand in furthering this program. Society today calls upon the government, the press, the church, the school, the judiciary, the health department, the manufacturer, the employer, the men's club and the women's club to assume positions of leadership in this regard, for each of these institutions is responsible in a measure for the welfare of those who come within its reach.

Taking the city as a unit, every man, woman and young person should know the facts of the case, and every city should have at least one reputable, authorized venereal clinic for treatment of those diseased. Yet this whole program of education and treatment will advance no more rapidly than warranted by the stimulus of public opinion.

In the fight against yellow fever, led by Surgeon-General Gorgas of the Army, it was public opinion which determined the measure of success achieved. The fight against venereal diseases, also sponsored by him and conducted with the same strategy and thoroughness, is again dependent upon public sentiment for its advancement. Each of these crusades has resolved itself into a question of method. To combat venereal diseases some adhere that it is better to hide one's head in the sand with the ostrich in an attempt to dodge the facts and conceal the danger. But, fortunately, the national and world crises and the immediate need of conserving man-power have shown this class of reticent and excessively immaculate individuals that they and the ostrich too can make a better fight in the open and in full view of their adversary.

The responsibility of the civil community to the Army and Navy, as well as to itself, is first of all to conduct a thorough campaign of education upon the nature and danger of venereal diseases, and this campaign may well furnish a platform of unity for the government, the press, the church, the doctor, the employer and the lay organization and club.

Secondly, the enforced treatment of all known infected individuals should be instituted and,

along with this, there should be an attempt made to locate all existing foci. This requires legislation or regulation making venereal diseases reportable with other communicable diseases, it requires the establishment of approved clinics for treatment, operated preferably at night under trained personnel, including one or more workers to follow up individual cases. It requires legal machinery also to put the quack and charlatan out of business and also to prevent the druggist from prescribing for a venereal disease.

Law enforcement is the third essential. Where prostitution exists and where illegal liquor traffic exists, no matter how mild it may be or under what subterfuge it is able to operate, either or both must be stamped out. However spotless a town or city may be,—and each citizen is apt to take a millennial view of his own town,—somewhere there can be found work for the vigilant law enforcer. He will generally find that the existing legal machinery and prevailing legal attitude are inadequate to cope fully with the increasing problem.

When vice is repressed, a substitute must be supplied to interest those who before were attracted by its accessibility and superficial glamour. Consequently there has developed the need for properly supervised amusement, recreation and counter-attractions of all kinds. This preventive principle of the counter-move has developed mainly in connection with the military and naval camps, but it is equally applicable to civil life. Why should not every large community maintain as a part of its permanent government an expert on recreation and an expert on vice repression?

It is gratifying to note that, under the impetus of the war, civil communities are operating along these four lines. Ten peace years could not have brought us the progress in this respect that one year of the conflict has done. From all sides we hear an increasing demand for facts. Soldier and civilian alike have a right to know the truth. Education, prevention and treatment are accorded the soldier of today. Why should they not also be accorded the civilian of today who is to be the soldier of tomorrow? The present drafted army has a venereal rate in excess of that of the regular army, and the second five hundred thousand of drafted men may be expected to maintain a rate correspondingly high unless the civil community assumes the responsibility of reducing it.

Prostitution and its counterpart, venereal disease, constitute a problem of hygiene and morality. On the hygienic side it is imperative that we locate infection, treat it and cure it. From the standpoint of morality we are challenged to prevent prostitution, to conserve morality and to stimulate idealism. The two phases are closely interwoven; the medical man and the moralist are working toward the same goal, the elimination of the social evil. Hence their efforts should be coöperative. The medical aspects of the problem have been treated at some length, but the moral side is of the greater import. In this crusade of treatment, repression, prevention and education we are battling for the fitness of our future generations, to give posterity a past to be proud of, unblemished physically by disease and morally by incontinence and the spirit of personal abandon. We are fighting to keep future generations out of blind homes, to reduce our syphilitic population (now eight per cent. of the total), and our large body of insane. We are fighting to prevent the broken hearts of American parents and the physical and moral wreckage of their descendants. Is this a fight which can be won by any sanitary regulation or pragmatic philosophy? Can it be won by anything short of the dynamic of a powerful idealism, which is inherent in every last one of us and which we may well cherish—in the words of Major Edward L. Keyes, Jr., with the knowledge that “our ideals are essential to the progress of our race.”

The issue of the hour is the winning of the war. Anything which impedes the earliest possible attainment of this end is the nation's menace. Conserving food, fuel and other resources is now engrossing the people's attention because these are immediately essential to the conduct of the great war enterprise; but of relatively greater importance, though less widely understood because hitherto concealed, is the immediate need for the control of venereal disease, as a direct conservator of *men*, as a means of adding power to the impending Allied drive upon the enemy, which is to scatter Hindenburg and his forces in retreat upon Berlin.

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THE SIGNIFICANCE OF VASCULAR HYPERTENSION.

The importance of the blood-pressure apparatus—the sphygmomanometer—in the diagnosis of disease can hardly be overestimated, and the taking of the blood-pressure record is now never left out of a careful examination. There is no doubt that the finger of the experienced examiner can detect marked variations in pressure, but such a method of blood-pressure determination is so unreliable, not to say unscientific, that no real reliance can be placed on it. Yet when the fact of high blood pressure has been established it is still a question whether it has any pathological significance, and if it has, whether it is a distinct clinical entity or whether it is only a forerunner of other pathological conditions. While high blood pressure is usually associated with certain chronic diseases—cardio-vascular and renal diseases—it is entirely likely that there are some patients in whom all the

symptoms suggestive of hypertension are due solely to the hypertension, and not at all to associated diseases or toxemias. Usually, however, when no pathological conditions are established it will be found that the hypertension is due to some form of intoxication. It may be due to chronic intestinal intoxication, defective metabolism and associated metabolic conditions, syphilis, gout, alcohol, or lead. Many of these non-organic cases of vascular hypertension may return to normal tension on the removal of the causes and proper treatment. On the other hand, if these intoxications are continued unchecked they will produce the fibrotic conditions associated with permanent hypertension. Very often, indeed, the onset of the usually insidious arteriosclerosis is with idiopathic hypertension. An intermittent hypertension is rather a sign of toxemia, while a continued hypertension is a sign of disease. But cardiac hypertrophy and permanent hypertension may result from continued and unchecked attacks of intermittent hypertension.

The use of drugs, in whatever form, which stimulate the vasomotor centers, or which stimulate the suprarenals to hypersecretion over long periods are very likely to be a cause of hypertension. This applies particularly to nicotine and caffeine. In the same way the excessive consumption of proteins may act the same way because of the presence of the protein extractives. Likewise, very hard work, competitive athletics, hard training cause first high tension, and then hypertrophy, arteriosclerosis, and permanent high pressure. So much high tension accompanies renal disease that the two are nearly always associated together. Syphilis is, perhaps, the only condition in which there is as much high tension as in renal disease, but without the presence of the latter. High pressure is too often followed by renal symptoms. It is the experience of most observers that if a case of hypertension is watched for some time albumin and casts will be soon discovered. Of course, the height of the mercury in the sphygmomanometer must not be taken by itself as an indicator of the conditions present in the patient. The patient must be considered with the readings. A blood-pressure reading may be high in one individual and normal in another, that is, within reasonable limits. Older people can have a much higher pressure than younger ones, and without special significance. Very old people normally have high

pressures. However, as a general rule, it may be said that a pressure of 150 mm. of mercury in a middle-aged person requires attention. In fact, most insurance companies consider people with that pressure as bad risks generally.

VACCINE IN THE TREATMENT OF WHOOPIING COUGH.

PERHAPS one of the most justly dreaded and serious diseases of childhood is whooping cough, not even so much for its immediate effects, although it is a disease of high mortality, but more so for its complications and sequelae, particularly tuberculosis, and debility. Until the discovery of the specific agent of this disease—the Bordet-Gengou bacillus—nothing could be done by way of prophylactic treatment, and the active treatment had to be entirely empirical and was largely unsatisfactory. In any event, the disease is highly infectious, and isolation must be carried out rigidly, even against suspected cases, for it is they who are always the most potent factors in the spread of disease. For successful prophylaxis or satisfactory treatment of active cases early diagnosis is essential; and until diagnosis is established, the sputum and the vomitus must be particularly guarded from contact with others. Infection with whooping cough is by the so-called droplet method, and if contacts can be kept free from the patient's discharges there is no likelihood of infection. Because other catarrhal diseases often give paroxysmal coughs, a positive diagnosis can be made only from culture.

The vaccine treatment should be instituted the moment the disease is suspected. When the paroxysms are fully developed treatment is not satisfactory. Failure with the vaccine treatment of whooping cough when diagnosis is not made from cultures is often due to the fact that the paroxysmal cough is not due to the Bordet-Gengou bacillus. The influenza bacillus is particularly likely to cause it. On the other hand, there are many strains of the Bordet-Gengou bacillus, and a pure culture of one strain will be of no avail in treatment when infection is caused by another strain. The administration of pertussis vaccine is harmless, and there is no danger of producing by it any anaphylactic reactions, and so an increase of symptoms, rather

than an amelioration of them. While the treatment of the disease with the vaccine during the paroxysmal stage is not as satisfactory as in the earlier stages, yet the severity of the paroxysms is much lessened and the disease much shortened. The dosage used in active or in prophylactic treatment is practically identical. In active cases it may be continued for a week or ten days—injections every other day. Usually dosage is commenced with five hundred million. Then one, two and three billions every other day in succession. The administration of the vaccine to all who are exposed will be found to reduce contact infection in a very large degree. There is no reason why with isolation and prophylactic dosage to every possibly exposed child, the disease should not eventually be reduced to a negligible number.

While ordinarily pure cultures are used in the preparation of the vaccines, some of the proprietary vaccines are polyvalent, composed of the Bordet-Gengou bacillus, the influenza bacillus, the streptococcus, the staphylococcus.

Finally, in condemning failures with the use of the vaccine in the treatment of the active cases it must not be forgotten that when the use of the vaccines is commenced late in the disease, the damage to the body or the inception of complications and sequelae have already set in, which the vaccine treatment can neither remedy nor repair.

THE FOOD VALUE OF THE BANANA.

THE imperative need of food conservation, especially in food that is capable of shipment abroad, has done much to revive the subject of food values and food substitutes. It is intended to urge for home consumption food that does not demand home acreage for production, that is not so feasible for shipment abroad, but which, nevertheless, has sufficient food value to make it desirable. Of such foods the banana seems to answer the purposes very well. While an essential article of diet in the tropics, numerous objections have been raised against it as a substantial food in this country, chief among which has been its alleged indigestibility and the large quantities that would be required to make it a food staple. The value of the banana can be better understood from a consideration of its composition. Like most fruits, its main

ingredient in point of quantity is water, ranging often beyond 80%. On an average, the solid content comprises about 22%, most of which is carbohydrate. The protein content is low—less than 1.5%. The fat content is about .6%, and the ash about .8%. The calories per pound are estimated at about 460, and compare very favorably with many other foods. The banana is essentially a carbohydrate food, and although it has a comparatively high caloric value it cannot take the place of the nitrogen-containing foods because its protein content is so low. It is, rather, a producer of heat and energy than a replacer of tissue, as protein foods would be. In the unripe stage, the carbohydrate is mainly in the form of starch; in the ripe stage, usually invert sugar. The sugars are both reducing and cane sugars. It seems that a greater amount of sugar, comprising glucose, sucrose and levulose, can be borne without gastro-intestinal disturbances when given as banana than in any other form.

The ash is composed mainly of base-forming salts, and is, of course, of high value to the organism. It obviates the tendency to hypoalkalinization and acidosis that the overingestion of carbohydrates is so likely to bring about. Not much has, however, been said about the vitamin content of the banana, and it would seem that, in common with other fruits and starchy foods, it is low in vitamin content.

It goes without saying that, like other fruits, the banana should be eaten only when thoroughly ripe. Any reputation that the banana has gained as an indigestible food has come from consuming the unripe fruit. The unripe banana consists of indigestible starch, whereas when ripe it is converted into very digestible sugars. Even the consumption of large quantities of the ripe banana will cause no discomfort or gastro-intestinal disturbances. Indeed, the objection to this food as a staple article of diet, even for an inconsiderable period, is that so large a quantity of it would have to be consumed to satiate. Because it is almost wholly carbohydrate, and really a one-sided and unbalanced food, it would never do to make it the main or sole article of diet. It was never intended that it should be. The banana is advocated, rather, as a very good, very digestible, and very cheap food, and with many other advantages thrown in. With a better understanding of its value, time of eating and preparation,

it promises to remain a very important part of our dietary, even after the urgent needs of conservation are over.

BOSTON CITY HOSPITAL ALUMNI ASSOCIATION.

THE annual meeting of the Boston City Hospital Alumni Association was held on Thursday March 21, 1918. In the leading columns of the present issue of the JOURNAL is published a complete report of the exercises at the Hospital in the forenoon in dedication of the new memorial tablet to the late Dr. David W. Cheever, in the Surgical Amphitheatre which now bears his name. After these exercises, the usual luncheon was served in the Hospital Library.

In another column of this issue of the JOURNAL are published also the memorial resolutions adopted as a testimonial to the late Dr. John G. Blake at the evening meeting of the Alumni Association at the University Club, under the presidency of Dr. George H. Washburn. At this meeting addresses were made by the president, by Mayor Peters, and by Dr. George W. Gay. Major John J. Dowling and Dr. Edward H. Nichols spoke also in behalf of the Boston City Hospital Unit, now organized as United States Base Hospital No. 7, and in training at Camp Devens, Ayer. This unit comprises 30 surgeons and physicians, 100 women nurses, 200 male nurses, orderlies, cooks, drivers, and mechanics. It is equipped to maintain an institution of 1000 beds. Other addresses were made by Dr. Charles A. Porter, Dr. Channing Frothingham, Dr. Henry S. Rowan, and Mr. Thomas Forsyth. The following officers were elected for the ensuing year: Dr. George H. Washburn, president; Dr. H. L. Smith, Nashua, N. H., vice-president; Dr. Cadis Phipps, secretary; Dr. W. R. P. Emerson, treasurer.

CONSERVATION OF SUGAR, ALCOHOL, AND GLYCERIN.

THERE is urgent need for the country to use with the utmost care existing stocks of sugar, alcohol, and glycerin. The work of Wimmer of New York and Upsher Smith of St. Paul, Minn., has shown that it is possible to reduce largely

the amount of these materials used in medicine by the adoption of infusions, decoctions, and solid forms of medication, such as capsules, in place of elixirs, syrups, fluid extracts, and tinctures. As the choice of medicine rests with physicians, the successful conservation of sugar, alcohol, and glycerin in this respect depends largely upon them; and upon the profession throughout the country should be urged the desirability of prescribing in accordance with this method wherever possible. It is also desirable that this matter should be fully discussed at medical meetings, in order that all may fully realize its importance, and may do everything in their power to assist this movement of conservation, which cannot fail to be of material assistance to the country and to the United States Food Administration..

MEDICAL NOTES.

LONDON DEATH RATES IN JANUARY.—Statistics recently published show that the total death rate of London in January, 1918, was 19.4 per thousand inhabitants living. Among the several districts and boroughs, the lowest rate was 14.5 in Wandsworth, the most populous of the southern areas, and the highest was 34, in Shoreditch, an East End slum. In the absence of any important epidemic, however, this unusually high rate may probably be taken as indicating the local incidence of air raid casualties, or of deaths due to munitions explosions.

COMMISSION FOR A WOMAN PHYSICIAN.—Report from Washington, D. C., on March 19, states that Dr. Kate B. Karpels of the Emergency Dispensary of the Army Medical Department, has been appointed first lieutenant in the U. S. Army. It is said that she is the first woman physician to receive a commission of this rank in America.

RESOLUTIONS IN RELATION TO THE INTERNATIONAL SURGICAL SOCIETY.—It was agreed at a meeting held in Paris on November 3rd, 1917, of delegates of the International Surgical Society from Belgium, France, Great Britain, Serbia and the United States of America, that:

1. The International Surgical Society be dissolved after the publication of the Volume of Transactions of the Meeting held at New York City, April 14th, 1917. Should any money remain after the publication of the volume, such

money will be divided pro rata among members. Each member of the Austro-German group will receive his share; but the money belonging to members from other nations will be retained and applied to some object of scientific reparation in Belgium.

2. A new Society will be created after the war on a similar basis, to be called the "Inter-Allied Surgical Society." Surgeons of neutral countries may also be elected members.

DENTAL SCHOOL OPENED TO WOMEN.—Report from St. Louis on March 18, states that upon the recommendation of Dr. John Kennerly, Dean of the Dental School of Washington University, this school will be opened to women, beginning with the academic year, 1918-1919.

HOSPITAL FIRE IN OTTAWA.—Heroic efforts of nuns and nurses saved all but one of 158 patients in the Water Street General Hospital in Ottawa, which was partially destroyed by fire on January 10.

WAR NOTES.

MOBILE OPERATING UNIT.—The Government is organizing a mobile operating unit for service in France, to consist of sixty surgeons, fifty nurses, and two hundred and fifteen enlisted men, according to an announcement by Major Fred W. Bailey, who is attached to the Surgeon-General's office at Washington.

The mobile operating section, whose members will be skilled in head, chest, and abdominal wounds, will move about as near the front line of battle as possible. Its equipment will be mounted on trucks. Under present arrangements, wounded men are sent to first-aid stations, which usually are situated near the third-line trenches. From there they are moved to evacuation hospitals, which are often located at a distance.

FIVE THOUSAND NURSES NEEDED BEFORE JUNE.—A call for 5000 nurses between now and June 1 for services in military hospitals at home and abroad, has been made to the Red Cross by Surgeon-General Gorgas of the Army. Nearly 7000 nurses have already been supplied by the Red Cross, but the need for more grows imperative daily. Of the 80,000 or 90,000 registered nurses in the United States, General Gorgas estimates that approximately 30,000 will be needed for service in Army hospitals this year.

Miss Jane A. Delano, Red Cross director of nursing, today issued an appeal to the country's nurses to volunteer. She pointed out that such nurses would be eligible to participate in the Army and Navy insurance at nominal rates.

BOSTON AND MASSACHUSETTS.

WEEK'S DEATH RATE IN BOSTON.—During the week ending March 23, the number of deaths reported was 280, against 272 last year, with a rate of 18.61, against 18.36 last year. There were 36 deaths under one year of age, against 33 last year.

The number of cases of principal reportable diseases were: diphtheria, 89; scarlet fever, 35; measles, 192; whooping cough, 61; typhoid fever, 1; tuberculosis, 79.

Included in the above were the following cases of non-residents: diphtheria, 22; scarlet fever, 15; measles, 3; tuberculosis, 6.

Total deaths from these diseases were: diphtheria, 3; scarlet fever, 1; measles, 2; tuberculosis, 30.

Included in the above were the following non-residents: diphtheria, 1; tuberculosis, 4.

ANNUAL MEETING OF THE INSTRUCTIVE DISTRICT NURSING ASSOCIATION.—At the 32nd annual meeting of the Instructive District Nursing Association, the president, Mrs. Ernest Amory Codman, made the following report:

"195,562 visits were made by our nurses in 1917 to 17,001 patients. With an increase of \$13,600 in expenses, the deficit, \$2000, was the lowest in four years; 257 new subscribers have been gained, and four churches have given us steady support. Since the beginning of the year, a new memorial nurse has been added to the nine which have already been given. The Red Cross automobile service has been generous in its help, and the Woman's Peace party, the first agency to contribute the whole cost of the supplies, has given thousands of surgical sponges. Volunteers have helped in many ways. A new school for public health nursing, under joint direction of Simmons College and the Association, is to be established as a result of the public health courses which have been given under the direction of Miss Anne Hervey Strong. This school will make possible in five years a college and nursing education which otherwise would take seven. We believe this is the only place where such a plan has been decided upon."

The officers of the Association were re-elected, with the exception of Mrs. Robert L. DeNormandie, who will be second vice-president, in place of Miss Emily G. Denny resigned.

Miss Anne Hervey Strong, director of the In-

structive District Nursing Association-Simmons College courses in public health nursing, has been appointed a member of a committee which is to coöperate with the committee on nursing of the medical board of the Council of National Defense in working out the details of the plans connected with a course for nurses in the Vassar College nurses' training camp.

BOSTON DISPENSARY ASKS \$50,000.—The Boston Dispensary, a charitable corporation having no connection with the city government and in receipt of no city funds for its maintenance, was the worthy beneficiary of a brief but vigorous drive for \$50,000 during the week of March 25. This institution has for 122 years been helping the sick of Boston, and has never before asked the public for funds. This campaign was the result of a deficit last year, when the institution was 50% self-supporting. The deficit was caused by the increased cost of all supplies and increased expenses, and the extra war effort for the suppression of venereal diseases, in which the dispensary is a leader.

A committee of more than forty prominent business men, physicians, clergymen, and educators, and a number of women whose names are identified with high social service, took charge of the campaign. The active canvass was under the direction of Miss Kate McMahon, with ten teams, each composed of ten women. The appeal was directed in a substantial measure toward those who have benefited from the ministrations of the Dispensary in the past, or who in the future might so benefit.

The Dispensary now treats about 35,000 men, women, and children in its out-patient clinics, and more than 6000 patients are treated in their homes by district physicians each year. About 700 babies and children are cared for in the Hospital for Children. Of the 41,000 patients, half are wage-earners.

COMMISSIONS FOR MASSACHUSETTS PHYSICIANS.—Report from Washington, D. C., on March 19, states that the following Massachusetts physicians have recently been appointed to the Medical Reserve Corps of the United States Army, and have accepted commissions of the ranks specified.

Captains—J. F. Fennessey, Boston; O. C. Swope, Boston.

First Lieutenants—G. C. Bergaron, Springfield; J. D. Milot, Fall River; T. W. Wickham, Boston; G. L. Curran, North Adams.

NEW ENGLAND NOTES.

ANNUAL REPORT OF THE BUTLER HOSPITAL, PROVIDENCE, R. I.—The seventy-fourth annual meeting of the Corporation of the Butler Hospital of Providence, R. I., was held on January 23, 1918, and the following matters were reported. The hospital staff has been much depleted by the war. Major Arthur H. Ruggles, M.O.R.C., first assistant physician of Butler Hospital, has been placed in charge of one of the different base hospitals belonging to the Army, and has been receiving preliminary training in the Craiglockhart War Hospital, near Edinburgh. It is expected that he will soon be ordered to the front in France. The Superintendent of the hospital has been appointed by the Governor of Rhode Island a member of the Medical Advisory Board in connection with the second draft. Others of the staff are performing like valuable service.

During the year of 1917, 295 patients have received treatment at the hospital. The average admission rate for the year was \$23.69, while the average weekly cost was \$27.41. The expenses of operation for the year totaled \$203,127.23, against \$196,091.54 income. The balance was made up by the generous use of the hospital funds on the part of the Trustees. Beneficiary funds were drawn upon to the amount of \$18,573.12, and the sum of \$9,984.47 was received from the State of Rhode Island.

Seventeen probationers were admitted to the women's nursing service during the year, fourteen of whom were accepted. Eleven women and thirteen men completed the two years' course.

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Middlesex South, WILLIAM C. HANSON, M.D., Belmont.
Norfolk South, DANIEL B. REARDON, M.D., Quincy.

HAMPSHIRE DISTRICT MEDICAL SOCIETY.—The regular meeting of the Hampshire District Medical Society was held at the Forbes Library, at Northampton, March 14, 1918.

Voted: That we approve of an increase in the annual dues of the Massachusetts Medical Society, if necessary, the amount to be determined by the Council.

Papers:

Dr. E. H. Copeland Gastric Tetany

Dr. N. G. Haskell Pyloric Spasm

Discussion.

Adjourned to Boyden's for lunch.

C. T. Cobb, *Sec. pro tem.***OFFICERS OF THE DISTRICT MEDICAL SOCIETIES.**

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NORFOLK SOUTH.—J. H. Ash, Quincy, President; E. N. Bushnell, Quincy, Vice-President; F. H. Merriam, Braintree, Secretary, Treasurer and Librarian.

PLYMOUTH.—_____, President; Gilman Osgood, Rockland, Vice-President; A. C. Smith, Brockton, Secretary, Treasurer and Librarian.

SUFFOLK.—H. F. Vickery, Boston, President; J. B. Blake, Boston, Vice-President; G. G. Smith, Boston, Secretary; E. B. Young, Boston, Treasurer; W. F. Cones, Boston, Librarian.

WORCESTER.—M. F. Fallon, Worcester, President; W. L. Johnson, Uxbridge, Vice-President; E. L. Hunt, Worcester, Secretary; G. O. Ward, Worcester, Treasurer; G. C. Lincoln, Worcester, Librarian.

WORCESTER NORTH.—E. G. Fosgate, Ashburnham, President; A. H. Pierce, Leominster, Vice-President; C. H. Jennings, Fitchburg, Secretary; F. H. Thompson, Jr., Fitchburg, Treasurer; A. P. Mason, Fitchburg, Librarian.

Miscellany.

ANNUAL MEETING, AMERICAN MEDICAL ASSOCIATION.

It is announced that the sixty-ninth annual meeting of the American Medical Association this year will be held in Chicago, June 10-14. The local executive committee of arrangements is made up as follows:

Ludvig Hektoen, *Chairman*
Charles J. Whalen, *Secretary*
William A. Pusey, *Treasurer*

John V. Fowler Frank Billings
Hugh T. Patrick James B. Herrick
Malcolm L. Harris Chas. E. Humiston

This committee is actively engaged in perfecting plans for the comfort and entertainment of the members and their guests. All correspondence with this committee or with any of its sub-committees should be addressed to 25 East Washington Street, Chicago.

The chairman of the sub-committee on clinics, Dr. Charles F. Humiston, announces that there will be a series of clinics for the Fellows of the Association on Thursday, Friday and Saturday, June 6, 7 and 8, and on Monday and Tuesday, June 10 and 11.

These clinics will cover every phase of medicine, surgery, and the specialties, and will be conducted by leading Chicago commissions.

Alumni and section dinners will be held on Wednesday evening from 6 to 8 o'clock so as not to conflict with other events which are being planned. The chairman of the sub-committee on alumni and section entertainment, Dr. J. H. Stowell, announces that his committee is co-operating with officers of alumni associations in arranging for reunions. The committee desires, also, to assist the officers of those sections which desire to arrange for section dinners.

The following hotels have been tentatively designated as general and section headquarters for the Chicago Session, June 10 to 14:

GENERAL HEADQUARTERS: HOTEL SHERMAN, North Clark and West Randolph.

PRACTICE OF MEDICINE: Hotel Morrison, 83 West Madison.

SURGERY, GENERAL AND ABDOMINAL: Auditorium Hotel, 430 South Michigan.

OBSTETRICS, GYNECOLOGY AND ABDOMINAL SURGERY: Congress Hotel, South Michigan and Congress.

OPHTHALMOLOGY: Hotel LaSalle, LaSalle and West Madison.

LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY: Hotel LaSalle, LaSalle and West Madison.

DISEASES OF CHILDREN: Congress Hotel, South Michigan and Congress.

PHARMACOLOGY AND THERAPEUTICS: Auditorium Hotel, 430 South Michigan.

PATHOLOGY AND PHYSIOLOGY: Auditorium Hotel, 430 South Michigan.

STOMATOLOGY: Congress Hotel, South Michigan and Congress.

NERVOUS AND MENTAL DISEASES: Blackstone Hotel, South Michigan and East Seventh.

DERMATOLOGY: Blackstone Hotel, South Michigan and East Seventh.

PREVENTIVE MEDICINE AND PUBLIC HEALTH: Auditorium Hotel, 430 South Michigan.

GENITO-URINARY DISEASES: Auditorium Hotel, 430 South Michigan.

ORTHOPEDIC SURGERY: Congress Hotel, South Michigan and Congress.

GASTRO-ENTEROLOGY AND PROCTOLOGY: Auditorium Hotel, 430 South Michigan.

SCIENTIFIC EXHIBIT, REGISTRATION BUREAU, COMMERCIAL EXHIBIT, INFORMATION BUREAU, AND BRANCH POSTOFFICE: Hotel Sherman, North Clark and West Randolph.

RESOLUTIONS IN MEMORY OF DR. BLAKE.

The following testimonial to the memory of Dr. John G. Blake was presented at the annual dinner of the Boston City Hospital Alumni Association at the University Club on the evening of March 21, 1918.

Dr. John G. Blake's connection with the Boston City Hospital covers its history from its opening almost to the present day. Now it has become a part of the history which he helped to make.

Appointed in 1864, his name has been borne continuously on its roster, at first as the Junior

Visiting Physician, later as Visiting Gynecologist and since 1900 as Senior Physician. In each capacity he gave faithful and unstinting service. His interest in the institution, which had become an integral part of his life, never flagged. He was a constant attendant at the meetings of the staff of which he was long Vice-President. He had the imagination to grasp the possibilities of the municipal hospital service to the community, not only in the care of the sick poor, but as a center of medical education, and by his advice and votes worked consistently to widen the scope of its activities. He saw clearly the necessity for keeping it from political affiliations and successfully cast the weight of his influence to keep it free. He was a valued member of many of the important committees of the staff. His sympathy with young men, his optimism and his kindness, which never impaired his sense of justice, assured his success as chairman of the Committee on Discipline.

As a medical teacher he was justly popular, clear, concise, and practical; he inculcated common sense, and while impressing the necessity for accurate diagnosis he never forgot the interests of the patient in his interest in the disease. As a practitioner of medicine he was eminently successful.

Patients recognized in him that indefinable quality called character, and sought him as a wise physician, a trusted counsellor, a devoted friend.

As a member of this association Dr. Blake shone with unrivalled luster. We all moved within the circumference of his orbit. He was an essential part of our meetings, and unavoidable circumstances alone prevented his attendance. He frequently appeared on the official list of speakers, but official omission often failed to save him from the popular demand to hear his voice; without it the occasion was incomplete. His charm, his wit, his vivid personality and his perpetual youth won our hearts, and we mourn the loss of our best loved member.

He met death as he met life, hopefully and courageously, with the mind of a man and the heart of a child.

We send to his family our high appreciation of his character and our heartfelt sympathy in their sorrow.

George G. Sears, M.D.

George W. Gay, M.D.

W. H. Prescott, M.D.

Committee.

SOCIETY NOTICES.

BOSTON DISPENSARY.—On April 9, 1918, at 8.15 P.M., the staff of the Boston Dispensary will hold its quarterly meeting at the above time. A program dealing with venereal diseases has been arranged with the State Commissioner of Health, Dr. Eugene R. Kelley, in charge. There will be four or five speakers representing various phases of the problem. Those of the medical profession who are interested in this subject are invited to attend. **HILBERT F. DAY,**

*Secretary of the Staff,
Boston Dispensary.*

NEW ENGLAND PEDIATRIC SOCIETY.—The fifty-third meeting of the New England Pediatric Society will be held at the Boston Medical Library, on Friday, April 12, 1918, at 8.15 P.M.

The following papers will be read:

1. An Unusual Food-borne (Probably Milk) Epidemic of Scarlet Fever.

Edwin H. Place, M.D., Boston
H. Linenthal, M.D., Boston
A. B. Lyon, M.D., Boston
M. C. Cheney, M.D., Boston.

2. An Analysis of the Wassermann Reactions Done at the Boston Lying-in Hospital for the Years 1916-1917.

John B. Swift, M.D., Boston.

3. Auto-serum Treatment of Chorea.

P. H. Sylvester, M.D., Boston.

Light refreshments will be served after the meeting.
CHARLES HUNTER DUNN, M.D., President,
RICHARD M. SMITH, M.D., Secretary.

SUFFOLK DISTRICT MEDICAL SOCIETY.—The annual meeting will be held on Wednesday, April 24, 1918, at the Boston Medical Library, at 8.15 P.M.

Business meeting; Reports of officers and committees, election of officers, incidental business.

The paper of the evening will be by Dr. Eugene Kelley, State Commissioner of Health, on

"The State Venereal Disease Program."

Guests will be welcome at the second part of the meeting, which will begin at about 8.45 P.M.

GILBERT SMITH, Secretary.

CENSORS' EXAMINATION.

The Censors of the Suffolk District Medical Society will meet to examine candidates for admission to The Massachusetts Medical Society, at 8 The Fenway, on Thursday, May 2, 1918, at 4 P.M.

Candidates, who must be residents of the Suffolk District or non-residents of Massachusetts, should make personal application to the Secretary and present their medical diplomas, at least one week before the examination.

For further particulars, apply from 2 to 5 P.M. to
GILBERT SMITH, Secretary.
99 Commonwealth Avenue.

NOTICE.

THE BOSTON MEDICAL LIBRARY is desirous of having a copy of the circular which was sent out to the profession in Boston in 1875 calling for a meeting to consider the formation of a Medical Library. Any one willing to send a copy to the Library, No. 8 The Fenway, will receive the thanks of

Yours very truly,
JOHN W. FARLOW, Librarian.

RECENT DEATHS.

GEORGE H. SHEDD, M.D. died recently at North Conway, N. H. He was head of the Memorial Hospital in that town, and had been a practising physician there for twenty years. For eleven years he practised medicine in Bartlett and Fryeburg, Me.